A. 3.

Hugh Cecil Earl of Lonsdale.

350 Horse-Shoeing as it is and as it should be. By **William Douglas**, (late) 10th Royal Hussars.

"Whoever hath charge of a horse's feet, has the care of his whole body."—OLD SAYING.

London. 1873.

8vo. 161 pp. 2 coloured engravings and woodcuts. M., $7\frac{3}{4}$ in. by 5 in.

Contents :—Chap. I.—The Foot of the Horse—its exterior. Chap. II.—The Anterior parts of the Foot. Chap. III.—The present method of preparing the horse's foot for shoeing. Chap. IV.—The proposed method of preparing the foot for the shoe. Chap. V.—Farrier's tools and their separate uses. Chap. VI.—The preservation of the hoof. Chap. VII.—Of diseases that may be attributed to shoeing. Chap. VIII.—Some suggestions how a scientific knowledge of the horse's foot could best be acquired by Farriers. Chap. IX.—About horse-shoes, old and new. Chap. X.—The Chaussée horse shoe. Chap. XI.—Beneficial effect of kindness upon horses.

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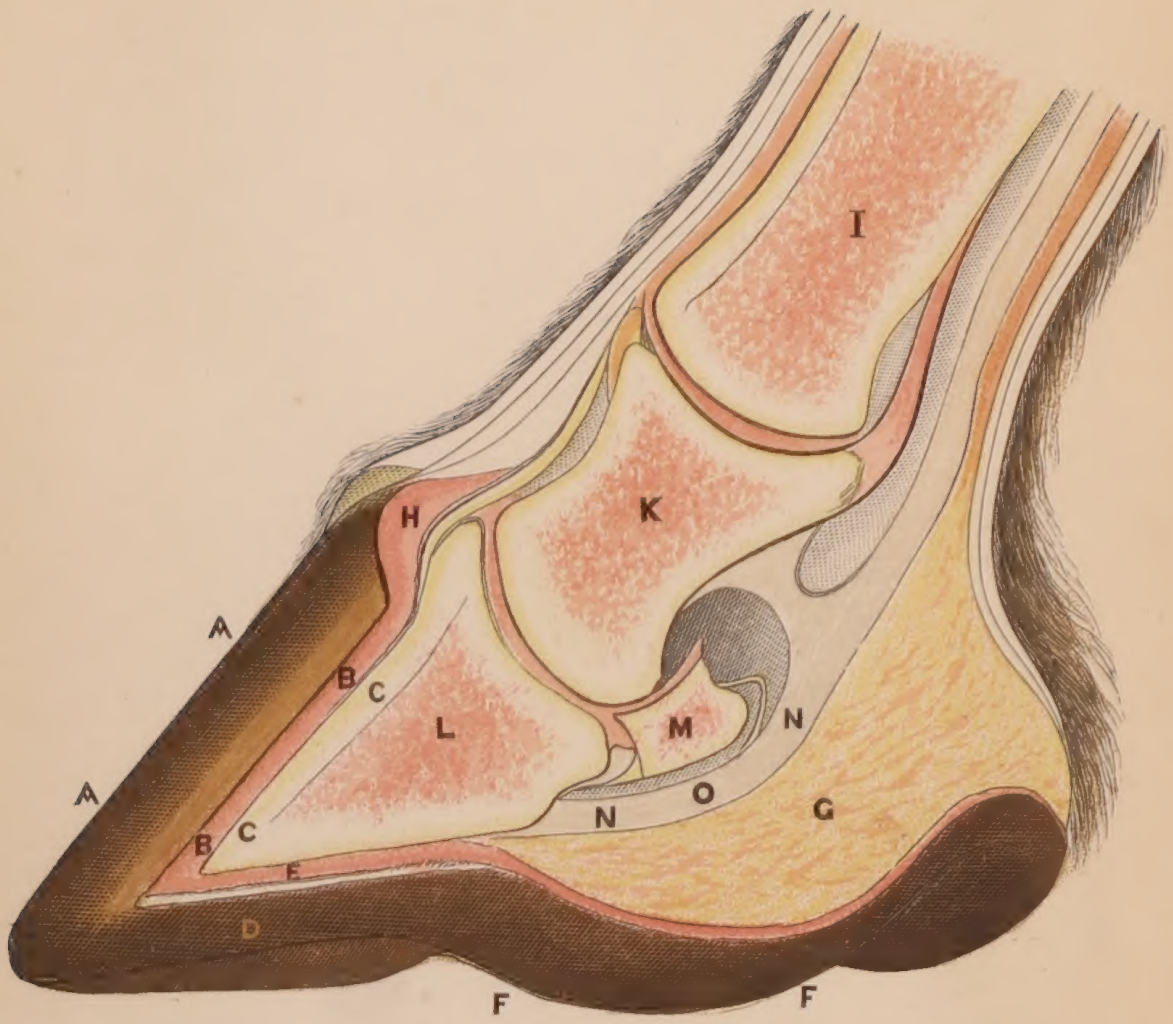
Housekeeping

HORSE-SHOEING AS IT IS

AND

AS IT SHOULD BE

SECTION OF A FOOT.



A.A. CRUST OR WALL.
B.B. INSENSITIVE LAMINÆ.
C.C. SENSITIVE LAMINÆ.
D. INSENSITIVE SOLE.
E. SENSITIVE SOLE.
F.F. INSENSITIVE FROG.
G. SENSITIVE FROG.
H. CORONARY BAND.
I. LARGE PASTERN BONE
K. SMALL PASTERN BONE
L. COFFIN BONE.
M. NAVICULAR BONE.
N.N. FLEXOR PERFORANS TENDON.
O. SEAT OF NAVICULAR DISEASE.

HORSE-SHOEING AS IT IS

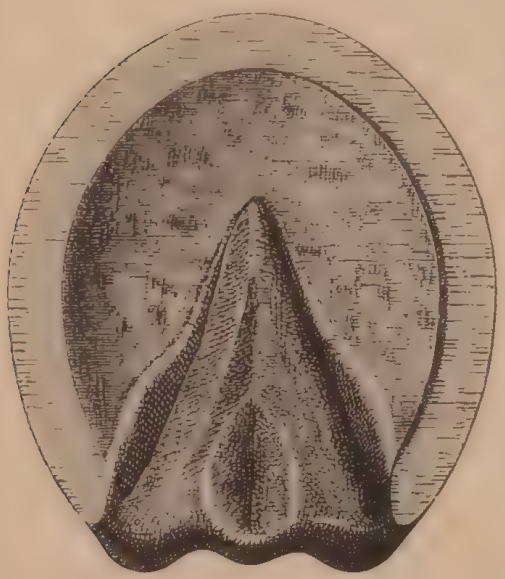
AND

AS IT SHOULD BE

BY

WILLIAM DOUGLAS

(Late) 10th Royal Hussars



"Whoever hath charge of a horse's feet, has the care of his whole body."

Old Saying

LONDON

JOHN MURRAY, ALBEMARLE STREET

1873

Printed by R. & R. Clark, *Edinburgh.*

PREFACE.

PASSING down Ludgate Hill one day, my attention was directed to the pitiful condition of a horse in the shafts of a large waggon. The poor animal was not drawing the load, but was being driven down the descent by the crushing weight behind, and, utterly unable, from the manner in which it was shod, to withstand this pressure, it had gathered its hind legs well under, and its fore legs well in advance of its body, in a helpless struggle to avert the fall, which it too evidently knew was at hand. Never did I witness such a picture of powerless terror as that horse presented, as with eyes starting, body shaking, and limbs stiffened, it was carried downwards against its will, until the fore and hind feet slipping in the same direction, it came down upon its left side with a crash.

The thought of what agony that poor beast must have suffered even before it fell has haunted me ever since, and knowing if the horse had but been able to use the supple elastic cushion nature

has provided its feet with to prevent their slipping—namely the frog—it could have easily controlled the pressure from behind, I resolved if possible to direct public attention to the present cruel and unwarrantable system of shoeing horses, believing it is only necessary for owners of horses, etc., to understand something of the anatomy and structure of the horse's foot to cause a more humane and sensible method to be adopted.

The aim of this book, therefore, is to show that horse-shoeing is no mystery, and that masters, and owners of horses, and grooms, may effectually avert injury to the horse and suffering to the animal, by knowledge of a few simple rules.

WILLIAM DOUGLAS.

5 Pearson Street, Battersea,
London, S.W.

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INTRODUCTION.

PHILIP ASTLEY, in his now almost forgotten book on Horsemanship, very justly remarks, "Certainly he that prevents disease does more than he that cures," and whoever has had the opportunity of observing the diseases which render horses unserviceable, must feel convinced of the applicability of this maxim to the present subject. It is well known that three-fourths of those ailments are due to some defect or injury to the feet, which could in many instances be traced to bad shoeing; and it is a matter for censure, as well as regret, that evils in our method of shoeing should flourish at the present day nearly as much as they did two centuries ago.

It certainly seems strange, that while the structure of the human hand has at all times been a subject for much and deserved admiration, the foot of the horse from a similar point of view has failed to become an equal subject for wonder. And when we recall the notably noble qualities of the animal, the courage, speed, strength, endurance, and docility of this incomparably best friend of man, our astonishment must materially increase. Combining the courage of the lion with the fleetness of the stag, the strength of the ox with the docility and affection of the dog, he daily and hourly

ungrudgingly performs such unselfish services to his master, as should call forth the gratitude of all, who, either as owners or servants, have to do with him. Surely, then, it ought not only to be a duty but a pleasure for us to make such a willing slave as happy and comfortable as it is in our power to do; and feeling in the performance that we could not do too much for one so deserving of the utmost sympathy and kindness at our hands. But I am sorry to say that, so far from this being the case, it is too often quite the reverse; and stranger to add, he frequently suffers as much from ill-advised kindnesses as he does from cruelty. With the wrongly perverse idea that he needs holding up to his work, his head is tied to his collar by a long strap, termed "*a bearing rein*," which is so adjusted, that if he makes but one false step, he must fall helplessly to the ground. Ignorant selfish humanity will not perceive that from a horse's head to the tip of his tail is a series of joints, every one of which, when the horse is in motion, requires to have free play; and that it is as necessary for a horse to turn his head, neck, and tail, when in active motion, as it is for ourselves to have the use of our arms when walking or running.

By somewhat similar tactics we cover the bottom of his feet with wide thick pieces of circular iron, so constructed as to give "*good cover*" to a part that nature has sufficiently protected. Nature, who never errs, has placed at the extremities of horses' legs pillars of horn for the animal to stand upon; that being a substance which, possessing the two essentials of lightness and

strength, is peculiarly well adapted for the purpose. That lightness is an essential of paramount importance at the end of a long lever like a horse's leg, is a fact most people, I should imagine, will readily admit, and yet, despite this fact, we allow the light but strong protection to be cut away and replaced by a wide piece of iron, often weighing five pounds, and in some instances as much as seven.

But the heaviness of the metal attached to do duty for much of what has in most instances been ignorantly removed, is not the only evil. "The horny substance on the feet of animals," as Sir Thomas More termed the hoof, is, when healthy, largely endowed with the property of elasticity, and this being the case we can easily imagine how much the natural play of the foot is impeded when a wide iron shoe is attached to it. If this much is granted, we have only to keep in mind that the horn is not only an elastic but an expanding substance, in so much as there is going on a continual growth of horn, while the metal shoe, in its cold hardened state when attached to the foot, remains in form unchanged, to be aware that one or the other must give, when our common sense tells us it will be the horn.

That shoeing, from the nature of our roads, is a necessity, I will at once concede, but at the same time I feel bound to state that the evil should be kept within certain limits, so far as the width, length, and weight of horse shoes are concerned. It is a common but delusive idea that heavy horses require much heavier shoes in proportion to their size than what light horses do. Now if we only remember that cart and other large horses have

feet in every way proportionate to their bodies, we at once perceive the absurdity of making a dray horse drag about with him shoes weighing five or even seven pounds a-piece, while a shoe that weighs ten or twelve ounces is considered sufficiently heavy for a riding horse to be shod with. Why should there not be a limit to the weight of iron every description of horse had to carry on his feet seems a natural question to ask, a limit when exceeded that ought to be punishable with a penalty for every offence. The scale might be as follows :—

Pony shoes to weigh from			6 oz.	to	10 oz.
Nags	„	„	10	„	14
Carriage horses		„	16	„	20
Cab „	„	„	18	„	22
Light draught	„	„	22	„	30
Heavy do.	„	„	30	„	40

It does not follow because a dray horse is twice the weight of a hunter, that the former requires shoes seven times heavier than the latter, in fact, as the horn on their hoofs is of strength in proportion to the relative size of the animals, their shoes need only be made in strength and thickness according to a similar ratio. In my opinion a heavy shoe helps to wear itself out, as a horse so overweighted must travel much harder than he would do if he wore a lighter description of shoe. To show, however, that I am not advocating what is practically impossible, I will relate a case in point. The directors of one of our railway companies, being desirous of testing the truths which the believers of shoeing on natural principles assert, had some truck and van horses

shod with narrow webbed shoes. In this experiment the frogs, soles, and bars, were left in their entirety, none of the horn being removed by the farrier's knife, except that portion of the crust which had grown since the previous shoeing. The old set of shoes when taken off weighed 17 lbs. 14 oz., while the new narrow-webbed ones put on, weighed only 10 lbs. the set; therefore we may easily assume that the original weight of the one set of shoes was at least double that of the other. And what was the result? Why, that the light shoes wore longer than the heavy ones had done; the average wear of the former being four weeks and five days each shoe, while the latter wore but three weeks on an average. But it is not the wear of iron so much as the wear of horse-flesh that I am anxious to direct attention to now. It will be seen, as the shoes that were taken off must have weighed 5 lbs. a-piece when new, those horses were at once benefited by having 10 lbs. less iron each to carry about with them. I will not attempt to calculate what difference 2½ lbs. of metal placed at the end of a lever two and a half feet long would be equivalent to, but will simply look at it as 10 lbs. extra weight carried by each of these animals. A horse when walking lifts his feet all round about thirty times a minute, and if we allow his day's work to last eight hours, the difference in favour of the lighter shod animals is over 64 tons, as under :—

$30 \times 10 =$ 300 lbs. per minute.
$300 \times 60 =$ 18,000 „ „ hour.
$18{,}000 \times 8 =$ 144,000 „ „ day of 8 hours = above, 64 tons—to be lifted unnecessarily.

Another noticeable improvement was observable in the step of the horses, who, with the lighter shoes on, lifted their feet much higher and more gracefully than ever they had been known to do before. This, however, only proved the truth of the old saying, that "An ounce at the heel tells more than a pound on the back."

Before going further, I must state that this essay is not intended for the instruction of veterinary surgeons, who, of course, know more of the subject than I can tell them. My object is simply to initiate owners of horses in the system not only of shoeing from the common-sense points of view, but likewise to give them some idea of the structure, conformation, and proper functions of the different parts of the horse's foot. Therefore, in following out this purpose, I shall endeavour to avoid as much as possible technical language, depending on the more simple words to explain my meaning, in the hope that an elementary style will be easier understood by those for whose benefit this treatise has principally been written, *i.e.*, for all who own or have the care of horses.

There are two classes of men who, from their respective avocations in being always connected with horses, are credited by the public generally with having a considerable amount of knowledge as to the ailments of these animals, and yet who generally know but little; therefore it will not be out of place perhaps for me to mention them first. I refer to grooms and farriers, the majority of whom, beyond being able to tell a horse's age up to a certain period, have, as a rule, in other respects, notably foot diseases and the principles of

shoeing, but a limited amount of knowledge. Ignorance is presumably at the root of these evils, and until it is incumbent on shoeing-smiths, coachmen, etc., to learn more about the physiological study of a horse's foot, it is to be feared matters will not much improve. Farriers, as a class, are not an exceptionally well-informed one, and it has often seemed to me a surprising thing that this should be so. Possibly they have a complete answer to my remark on their lack of knowledge of matters connected with their own particular province, and I should be glad to learn they have. To my idea the man who only pursues his trade or profession from no higher motive than to satisfy his appetite, and supply himself with lodging and clothing, is a man much to be pitied, for I consider nothing ennobles the mind more, or makes existence more delightful, than the feeling of being a necessary portion of the community, a portion that if removed it would be difficult to replace. Now, whoever has to do with horses may be in this position if they chose only to be kind and attentive to the animals they have in their charge. I have known men in the army refuse promotion because that would have separated them from their steeds, their tried companions for years. It was not of themselves they thought, they could have borne the separation, but what they feared was, that their old chargers would not fare so well with new masters as they had done with them, the old ones. Doubtless grooms and coachmen may be found who have refused better situations for precisely similar reasons, and if so, such men are

very valuable. The prevalent idea, however, is, that grooms, coachmen, and farriers, are usually neither kind enough nor forbearing enough to horses under their care. Yet the latter are the very men to whose tender mercies and judgment we are obliged to entrust the care of our horse's health, for in the words of the old saying, placed on the title-page of this essay, "Whoever hath charge of a horse's feet has the care of his whole body."

This nescience in many grooms and coachmen of horse-shoeing is much to be regretted, while the mischievous system of farriers giving a percentage to servants on shoeing-bills is a matter even more to be deplored, as it is the bad tradesmen who give most *discount*. Perhaps, as is alleged, some gentlemen do not pay those who have the care of their horses sufficiently, for the very reason that they, the masters, know their coachmen and grooms add to their wages by demanding contributions from the tradesmen who shoe or forage the horses, or supply coaches, saddlery, and harness. In such instances, however, I believe it would be found more economical to raise the wages upon the direct understanding with both tradesmen and servants that no discount was either to be offered or received, the penalties being the withdrawal of custom on the one hand and instant dismissal on the other. Under such regulations the prices now charged, I believe, would fall, when released from the percentage impost, proportionally far lower than it would be necessary to augment the groom or coachman's wages.

The power for good or evil, which to a great extent

must always remain in the hands of servants who have charge of horses, renders it all the more necessary they should be made to understand that the welfare of their four-footed friends depends quite as much upon these being shod on humane common-sense principles as upon good feeding and grooming. And from Englishmen being naturally fond of horses, I feel convinced if coachmen and grooms can be but made to understand —and no reason exists why they should not—how essential it is for a horse's foot to be allowed to remain in as near its natural state as possible, they will become as anxious as their masters in a cause which at present they regard with distrust, if not dislike.

And if it is imperative for grooms to understand something of the farrier's art, it is more binding upon owners to acquire a like information, because it affects their interests more. A gentleman should be able not only to tell whether any complaint made by his groom against the farrier was correct or not, but also to detect anything wrong in the shoeing, which an idle or an unprincipled servant might wish to conceal. Unfortunately, all gentlemen have not the time to look after their stud strictly, and some who have ventured to interfere with this—their servant's particular province—have not been very successful. With a certain description of grooms and coachmen any attempt by their master of this kind is met with by a regular system of annoyance, or, as this class terms it, *blistering*, which soon tires the master out. For instance, if a gentleman changes his farrier without this sort of groom's sanction, or ventures

to insist upon having his horses shod in any particular way, the blister is applied at once. "From early morn till dewy eve" nothing but accidents are reported, such as "The chestnut was down again this morning, sir; can't stand on his legs with them new shoes;" or it is, "The bay mare is cutting frightfully behind, told you how it would be, sir, if you got *So and So* to shoe for you;" or else it is, "The dun cob's gone as lame as a cat since he was shod yesterday;" and so the blister is applied until the gentleman, for the sake of peace and quietness, tells his groom or coachman to take the horses to Jericho, and have them shod how and by whom he likes.

If this was a mere matter of pounds, shillings, and pence to owners, as regards the shoeing of their horses, I should have been loathe to speak so plainly as I have done; but when I think of the immense suffering that those best friends of man endure, daily and hourly, perhaps through the ignorance of dependants, I feel that in the interests of humanity I must not only speak, but speak plainly, and I herewith appeal to all owners of horses to assist in putting down the present state of things. There is really nothing, it will be seen, in horse-shoeing or horse-management which any one could not acquire a better knowledge of in six months than some farriers and grooms now possess; and when really masters, by knowledge as well as by position, owners will find themselves to have acquired by this knowledge not only a greater amount of respect from their servants, but that their horses' health and condition have improved as well.

I do not wish it, however, to be supposed that these sentiments of mine are at all novel. A hundred years ago the Earl of Pembroke drew public attention to the same facts: "Whoever," his lordship wrote, "lets his farrier, groom, or coachman, even mention anything more than water-gruel, a clyster, or a little bleeding, and that too very seldom, or pretend to talk of the nature of the feet, of the seat of lameness, sicknesses, or their cures, may be certain to find himself very shortly and very absurdly quite on foot. It is incredible what tricking knaves most stable-people are, and what daring attempts they will make to gain an ascendant over their masters, in order to have their own foolish projects complied with. In shoeing, for example, I have more than once known that, for the sake of establishing their own ridiculous and pernicious system, when their masters have differed from it, they have on purpose lamed horses, and imputed the fault to the shoes, after having in vain tried, by every sort of invention and lies, to discredit the use of them."

Having pointed out these serious evils, I will now proceed with my subject, and after giving a short description of horse-shoeing in early times, point out how essentially necessary a proper shoe and style of shoeing is to the natural spring and action of the horse's foot, for upon these facts the whole matter rests.

The most careful investigation into the past history of horse-shoes leads me to believe that farriery as an art has but little claim to antiquity. Horse shoes, apparently, were unknown to the Greeks, and if to them,

to all other nations of earlier ages. Xenophon, who wrote the most complete work on horsemanship of his day, makes no mention of horse-shoes, while, on the other hand, he is particularly explicit as to the means to be taken to harden and toughen horses' hoofs. Specially for this purpose is a particular kind of stone pavement recommended, the advantages of which he has thus described: "It will cool, harden, and improve a horse's feet merely by his standing upon it, while the same benefit will result to his hoofs as if he were made to travel on stony roads every day." Another writer, Vegetius, holds forth in a similar strain, informing us "That the floor of the stable should not be made of soft wood, but of solid hard oak, which will make the horses' hoofs as hard as rocks." The testimony of Virgil is to the like effect, when he writes "*Caratque tellurem et solido graviter sonat ungula cornu*," or, as we may freely translate it, "The horse by the hardness of his horn hoofs, causes the ground to re-echo when he paws it in his strength."

Coming down to later times, the earliest record we have of iron shoes being used for horses is in the description of a shoe said to have belonged to the horse of Childeric, who lived A.D. 481. Mr. Beranger, in his interesting book about horses, mentions that an account of this shoe is preserved in "*Montfaucon's Antiquities of France;*" and from the drawing which accompanies the description it perfectly resembles the shoes used at present (1768) in that country. The same writer informs us "That the Kalmuck horses are never shod,

nor does it appear" says he "that shoes are necessary; the climate being very dry and the soil hard, the hoof is likewise so solid and indurated that nothing can hurt it." Farther on he writes, "the antients did not shoe their horses; that is to say they did not nail upon their hoofs any pieces of iron, or of other metal in the form and shape of the *modern horse-shoes*, but when they intended to defend them from anything that might annoy them in travelling, or the hardness of the ground, they fastened upon their feet, by means of straps and ligatures, a sort of sandal stocking, or what we call boots. These were made of sedges twisted together like a mat, or else of leather, and were sometimes strengthened with plates of iron, and adorned by rich and ostentatious people with silver and gold, as in the instances of Nero and Poppæa. In the collection of the late Baron Socks' *pastes* of antique stones, there is one which represents a soldier binding or tying on this sort of shoe."

Shoeing of horses has therefore been apparently only a necessity for the last few centuries, from which it may be concluded that the horse has been trained to have feet so tender and fragile as to make the use of iron as a protection to the horn compulsory. And with such facts before us, we might easily conclude that iron horse-shoes, only used at first to protect the feet of horses where the horn was unnaturally weak, had from this partial introduction gradually extended to all. But even now, in the Orkneys, in the mountains of Wales, the wilds of Exmoor and Dartmoor, many parts of the continent of Europe, and in a considerable por-

tion of the rest of the globe, horses and ponies run about over rocks, through ravines, and up precipitous ridges unshod. Yet this is all done without difficulty and to the evident advantage of their hoofs, for these animals never suffer from contracted feet, or from corns, sand-cracks, etc., until they have become civilised, and been shod. Yet we continue cutting away more and more horn, and putting on more and more *cover*—how I detest that word—without ever perceiving that when doing so we are acting in direct opposition to nature. Goats do not suffer from navicular disease or contracted feet, yet I firmly believe that if the experiment of shoeing with iron was but tried upon them, in a very few generations they would be as great sufferers from those diseases as horses are now.

It is precisely the same ignorant system carried out in close stables, carpeted with straw at all times, that now-a-days makes our horses so sensitive to every change in the weather, although in a state of nature no animal—not excepting the dog even—can stand cold of the utmost severity so well. The system of hot stables, and the horses always standing upon bedding, bears influenza as its fruit. This tells equally against the growth of healthy horn on the horses' hoofs, which being intended to carry them over hard roads or rocky paths in safety,—we, to ensure this, from the moment a horse is foaled, keep him either in grass fields soft to tread upon, or in warm stables standing on soft straw, and then we are surprised that his hoofs should become dry and brittle, instead of keeping moist, tough, and hard.

It is a remarkable fact that cavalry troop horses, which are *not* bedded down during the day, never suffer so much from corns, contraction, thrush, and grease, as the officers' chargers do, which have straw to stand upon whenever they are in the stable. We may depend that whatever has a tendency to heat the horn is injurious and leads to contraction, that most prolific of foot diseases ; and therefore straw-carpeted stalls are hurtful to the animals, which the coldest flooring of stables can never be.

Water, again—and too much of it cannot be applied to the feet and legs—is far before any other treatment for most diseases affecting those parts ; because, being the natural appliance to horses' hoofs, and at the same time cooling to the legs and strengthening and bracing to the muscles, its action on those parts must always prove beneficial. The practice of washing down horses' legs, therefore, with cold water when they come off a journey or from work not over severe cannot be sufficiently commended, provided that the legs are well rubbed afterwards, when they will soon dry. Grooms use warm water and bandages ; but as warm water only relaxes the sinews, in most instances already overstrained by exertion, the very coldness in the legs and feet are produced which the warm water and the bandages are intended to prevent. I am aware that Colonel Fitzwygram, in his otherwise excellent book upon horse-shoeing, objects to washing down, under the impression that this treatment produces cracked heels ; but so far from this being the case it is found practically to be quite the

reverse. In India, for instance, horses are exposed to heavy rains for weeks together, without taking any ill effects and in the finest of weather there, the *ghora-wallahs* use little other means to keep their horses clean than washing them down daily all over.

In regard to horse-shoeing, I am confident that one-half of the difficulty would immediately disappear if owners of horses would but bestow the same careful attention to the work of the farrier that they do to grooming and other matters. In the interests of humanity alone an alteration has become imperative, for however necessary it may be to protect the hoofs of horses by rims of iron, it is certainly scandalous to first destroy the horn by rasping, paring, and burning, and afterwards nail on great wide and heavy shoes to supply the defect or want of that substance which had been ruthlessly destroyed.

A reference to the "contents" at the beginning will show how the subject will be treated. In the first chapter, for instance, I will endeavour to point out that most of the diseases to which horses' feet are liable may be traced to the inconsiderate method commonly practised in shoeing them, combined with the hurtful treatment the hoofs are subjected to in the stables. Farriers in general are so desirous to excel in *neat* work, and grooms in having the *neatness* done to pattern, which, when combined with the pernicious habit of greasing the horn to make it shine, that the wonder is not only that one-third of our horses become lame in consequence of this treatment, but that the whole of

them are not incapacitated by it for work. If a horse's foot is dry and brittle, the groom covers it with grease or bees'-wax, destroying the vitality of the horn thereby; and the farrier, not to be behind hand in his share of the punishment, *covers* the foot with a heavy iron shoe. A very little knowledge of the structure of a horse's foot would inform these men that grease, by stopping the pores in the horn, prevented the air from acting beneficially upon its surface, and that the foot, which before could scarcely carry itself, would be quite unable afterwards to carry so much additional weight of iron.

The remedy remains in the hands of gentlemen who own horses; let theirs be the study how a horse should be shod, and how cared for; and then, being able to instruct their grooms and farriers—they, the owners, will earn the rich reward of having prevented much suffering from being inflicted upon these noble animals; besides keeping them not only in better condition for work but in better health as well.

CHAPTER I.

THE FOOT OF THE HORSE—ITS EXTERIOR.

Before entering upon the subject of shoeing, it would be desirable perhaps to describe what has to be shod. This is the hoof; a part of the foot which, to the superficial observer, presents but little scope for study,—simply a horn box to cover the interior parts and protect them from injury; its structure—whether fibrous or otherwise, is seldom inquired into, even by those whose whole study it ought to be to do so. A farrier picks up a horse's foot preparatory to shoeing, not for the purpose of detecting any malformation, and then striving to put on a shoe that will remedy existing defects, but only to look at the size, and see if he has a set of shoes ready-made which will answer. If he has not the exact article he either cuts down a larger or draws out a smaller shoe to the requisite size, burns it into its position, and nails it on, without ever considering it a subject for reflection whether the horn will not be injured by the application of strong heat, or if contraction of the foot will not necessarily follow when an ill-formed or badly adjusted shoe is thus attached to it.

Now, as the great art in shoeing is to preserve the foot in the best condition for work at all times, it stands to reason that the best means of doing so is to follow

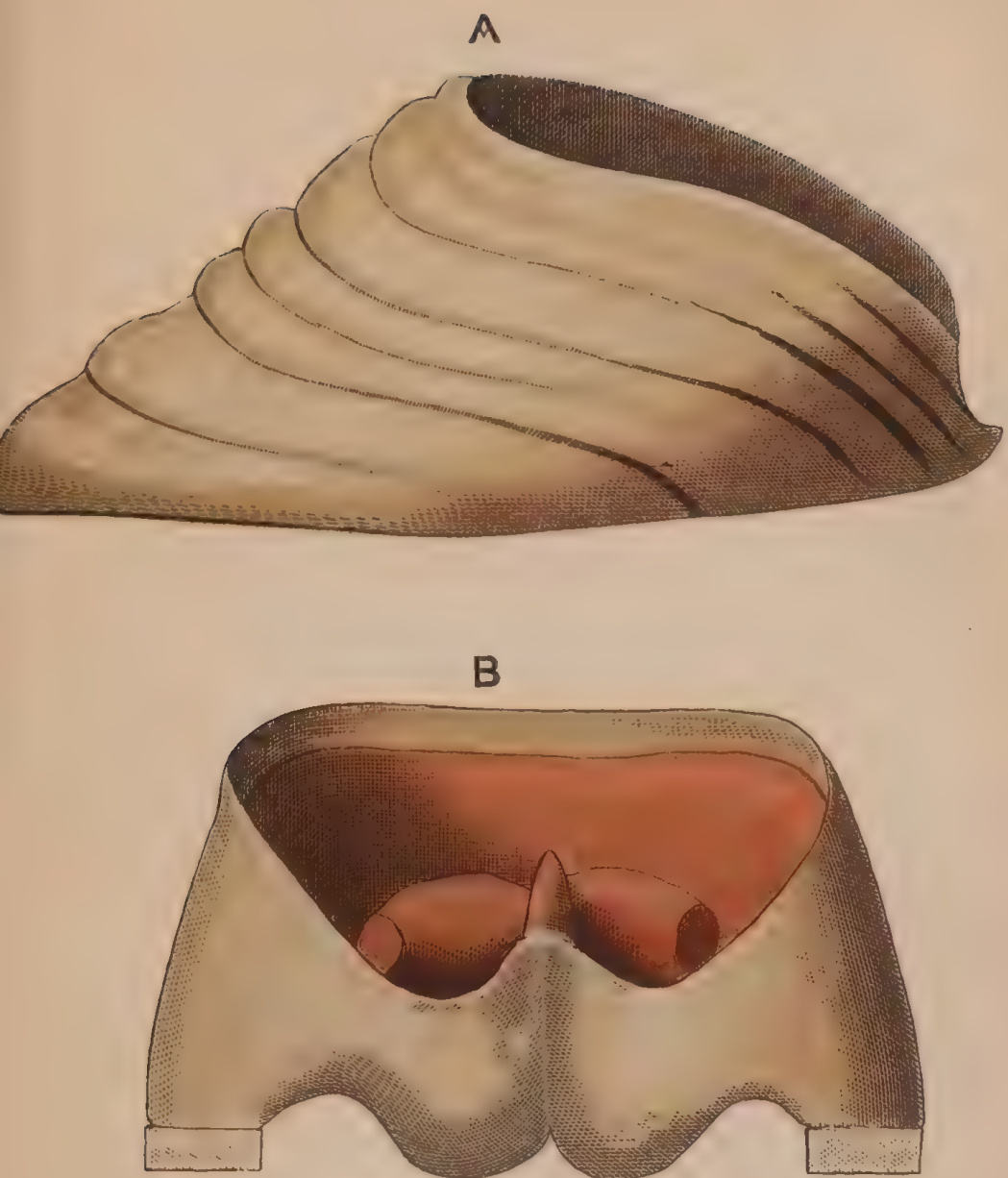

FIG. A. FLAT, THIN HOOF WITH WEAK, LOW HEELS; HORN THICK AT THE TOE.
FIG. B. VIEW OF THE INTERNAL CAVITY OF THE HOOF.

nature as near as possible. The horse walks upon the lower edge of the crust (or wall of the foot), the frog, sole, and bars—upon that portion of the foot which comes in contact with the ground. Now, as the frog, sole, and bars can take any amount of wear if left in their natural state, without injury, while the crust, from its more brittle nature, will not do so, it is evident that it is only the latter which needs protection; therefore it follows that the mechanical difficulty of fitting the shoe to the foot simply means the placing of a rim of iron round the portion likely to be damaged, in a way which would least annoy the animal. The foot of a horse is so formed that every part may be said to be constructed with direct reference to two important objects—viz. great firmness and great elasticity; the former to sustain the heavy weight, and the latter to diminish the pressure of that weight when subjected to the impulse of rapid and vigorous action. The principal parts of the foot are known by the following names :—

The (hoof or) outer portion.

The crust or wall.
The bars.
The frog.
The cleft of the frog.
The horny sole.
The heels.
The coronet.
The quarters.

The inner portion.

The laminæ.
The coffin bone.
The smaller pastern bone.
The navicular bone.
The coronary ligament.
The sensible frog.
The sensible sole.
The extensor tendon or front sinew.
The perforous tendon or back sinew.

There are other ligaments, tendons, bloodvessels, and nerves that enter into the construction of the foot, but the above-named will be sufficient for such general information as is required by those for whose instruction I am writing.

The hoof is that casing which includes and protects all the rest of the foot, and is in its nature similar to the nails of the human body, each growing or proceeding from the cutis or true skin. Where the true skin begins to change to horn, as at the coronary band, the hoof is extremely soft, thin, and white, becoming harder and thicker as it grows downwards. We therefore find the hoof, hard and horny as it is externally, constantly undergoing reformation, the new hoof progressing from the hair downwards in a similar manner to the human nail. In fact the crust or wall of the forefoot corresponds in a remarkable degree with the finger-nail, not only in its constant reproduction, but in the gradual thickening of the horn from its root to its extremity. It is hardest and thickest in the middle, in consequence of which any force is better exercised from that part than from the sides, where it is softer and thinner. Again, if the finger nail is attentively examined, it will be found very thin and tender where it leaves the skin, and, though it becomes gradually thicker as it advances to the top of the finger, the sensitive or quick part continues as long as it adheres to the flesh below. When the adhesion ceases, the horn at its extremity becomes so callous that we can pare it with scissors almost without knowing we are doing so, far less feeling

pain. It is precisely the same with the crust or wall of the foot, for where it joins the skin, that is at the point where the hair terminates, it is very thin, and this thin portion is called the "coronary ring"; the "coronary ligament" being a thick folding of the skin immediately covered by this thin part of the crust. The term "ligament" here, I should remark, is scarcely properly applied, as it is a mere covering to a mass of blood-vessels that supply the foot, having neither the substance nor the use of that organ which by anatomists is termed a ligament. The coronet is a circular line which marks the union of the pastern with the hoof.

The crust, though horny, is not solid, but fibrous in its texture; the design of it being twofold—first, to protect the sensitive foot from blows, and, second, by its elasticity, to prevent injury from concussion when the limb descends to the ground. If the crust was solid it would bind the foot like a tight bandage, and consequently would allow of no expansion when the weight of the body pressed the coffin-joint downwards; being fibrous, however, it yields to the extension of the foot at every step. In the forefoot, the hoof being thickest at the toe, admits of an elasticity, the point of the toe being as it were the fulcrum of the spring when the horse is most violently exerted, going at full speed or drawing a heavy weight. This elasticity, commencing at the frog, is continued from the quarters to the toe, the strongest and hardest part. The fibres here are consequently more numerous, and as their position is also nearly perpendicular, they are best adapted for bearing the shock or strain of a horse

when it is in motion. This uprightness in the fibres takes, however, a more slanting form as they get towards the heels, which, being assisted by the frog and bars, do not necessarily require to be of equal strength as at the toe, while the thinness of horn at that part permits of a slight expansion there when the weight of the horse pushes the flexor tendon down upon its natural cushion —the frog. What is termed the bars of the foot are formed by an involution of the crust on either side of the foot before it reaches the heels, at the parts which are called the quarters. They enclose the extremities of the cartilages, and act in a similar manner in the contraction and expansion of the foot; for when the ground is struck the elasticity of the bars helps to push open the heels, which, as they rise in the air, contract immediately again when the quarters are relieved from the pressure upwards and outwards to which they had been subjected.

The frog, which is properly but a continuation of the coronary band, returns from the heels inwards and forwards like a dart, or the shape of the letter V. It is enabled to yield to the expansion of the foot by having a cleft or opening in the middle, which thus expands and contracts as it presses upon or recedes from the ground. Though the frog is thicker than the parts from which it proceeds it is less compact in its texture, although the fibres of which it is composed are finer than the other portions, the difference being in their substance as wool is to horse hair.

If the crust is closely examined by aid of a micro-

scope, its structure will be found to consist of a number of bristle-like fibres standing on end, but bearing diagonally towards the ground. From the particular longitudinal construction of the fibres, it follows, as already explained, that they will bear a great amount of weight so long as they are kept in their natural state. The crust so viewed resembles a number of small tubes bound together by a hardened glue-like substance. Whoever has seen a *mitrailleur* or volley gun, with its numerous barrels all soldered together, can form a very good idea of the peculiar structure of the crust, especially if they were likewise to imagine the tubes to be filled with a thick fluid, the use of which is to nourish and preserve them. If we pass our hand slowly down the horse's leg from the knee, we will find that the skin is connected to the hoof by a band about three-quarters of an inch in width, which being thicker than the skin and more pliant than the horn is the connecting link between the two. This, as I have already mentioned, is termed the coronary band, and can be easily distinguished after a horse has been out in the rain, or standing in water for any time. Of a bluish colour, and closely resembling in appearance a thin band of vulcanised india-rubber, it is not only the bond of union between the skin and the hoof, but from it comes the secretion of horn that supplies the crust, as well as the fluid which covers the crust like a varnish, to enable it to retain the natural moisture necessary to its well-being. A still closer inspection of the fibres will show they possess a peculiar retentive quality, being in structure or shape much like

ears of barley. This conformation has its advantages and disadvantages, these being, that while it offers a resistance against foreign matter descending through the fibres, it assists the passage of anything upwards. Therefore it is that the nail, which fastens on the shoe to the foot, can be driven in with less force, and holds firmer when in, than if the substance was of a different nature; an advantage undoubtedly. On the other hand, however, as this peculiarity facilitates the passage of grains of sand, which once in the horn cannot get back again, and as they are the cause of sandcracks, the disadvantage will be equally apparent.

In order that the hoof may be strongest where the greatest strain comes, the toes of the fore feet and the quarters of the hind feet are the thickest and hardest parts of their respective walls. In the former we find the crust, thickest at the toe, becomes gradually thinner at the quarters, and weakest at the heels; while in the latter the reverse is the case, the crust there being thicker at the heels than at the toes. Curiously enough the human nails are similar in their construction, the finger nails being thickest in the centre, while the substance in the toe nails is thickest at the sides. Another noteworthy fact is, that the horn of horses' hoofs is generally thinner on the inside than on the outside portions, a peculiarity which I shall have to refer to further on, when pointing out the injury which rasping inflicts. If the fibres composing the horn are closely observed, it will be discovered that at the toe in each hoof they are nearest to the perpendicular, a quality

which gives them greater strength to resist the shock which the foot meets each time it is placed upon the ground, whether the horse is galloping at full speed, or drawing a heavy weight at a slow pace. Internally the horn is a laminated substance, but outwardly, as it continues towards the quarters, it turns more and more aslant, by which, especially in the fore feet where it is thinnest, it obtains a still greater power of yielding to the shock, and power of expansion, when the weight of the horse descending upon the frog causes that to press upwards and outwards at each step the animal takes.

At the extremity of each heel the crust is found to turn inwards and forwards towards the point of the frog, and in this new form and duplicate position it is termed "the bars." The usual name for these among the old school of farriers is "the binders," from an erroneous idea that they bind or hold the heels together, thus preventing expansion. To obviate this, ignorant individuals cut the bars away, in order, as they fondly imagine, to open the heels. Of course this causes the heels to close, and so insures the very contraction that their removal is intended to remedy. Besides, it ought to be plain to every one that this reduplication of the crust must be of service, as it secures a double bearing to the shoe at the heels, and thus prevents any undue pressure upon "the seat of corn." Again, this laminated substance at the heels, on its return as bars, although its positions are nearly horizontal, yet lie edgeways, and consequently are well adapted to bear pressure on their edge, as well as to permit of lateral expansion, an effect that continues to

the extremity of the bars. Therefore whatever description of shoe is used, if parts that are essential to the natural economy of the foot be not preserved, or if portions that are useless be allowed to remain, all shoeing must prove a failure; not so much probably from any fault in the shape of the shoe, but from the objectionable manner in which the foot has been prepared to receive it. Nature having provided the protections I have mentioned, any artificial covering, further than to that part which is liable to fracture, is certainly not only unnecessary but highly injurious, as the mutilation of the horn in any way only tends to take away friction and moisture, the two greatest preventatives of contraction.

In figure B, Plate II., I give a drawing of the horn box which covers the horse's foot, and it will be seen from this, that the crust and sole, and frog and bars, which are respectively smooth, concave, and convex, on their outsides, are laminated, convex, and concave within. The crust, with its mushroom-like interior surface, is a most noticeable structure; and when we are aware of the importance of these ridges, their peculiar appearance becomes still more interesting. A reference to Plate I., shows a section of the foot, and the reader will at once easily understand that the laminæ to be seen there covering the coffin bone, corresponds with, and completely fits into, the ridges in the interior of the crust at every step the horse makes. Being, as has been stated already, perfectly elastic, these sensitive laminæ at each movement of the horse fill up or recede from the insensitive horny laminæ in the interior of the hoof; so,

opening and closing at each step, they act as elastic springs, assisting to prevent concussion each time the foot comes to the ground, as well as helping to sustain the weight of the animal.

As every portion of the foot acts together in unison, it will be easily understood how necessary it is that the different portions should be allowed to remain unmutilated. I have explained how, when the foot leaves the ground, the laminated springs relax hold of their horny bed, and resume it again as the foot returns to the earth. And it is here that the uncut frog becomes of service, for although itself insensible to pain or feeling, it has the power, to a slight degree, of conveying sensation to the sensitive parts it protects. This is one reason why it is so important that the frog should touch the ground at every step, for when it is cut away or lifted out of action by the shoe, the horse is entirely unconscious of contact with the ground until the wall of the foot receives the blow through the shoe. When the frog is as near, if not nearer to the ground than the iron, the nervous sensation it conveys causes the muscles of the leg and the laminæ of the foot to be prepared for each concussion as it comes. On the other hand, when the frog is not permitted to act as nature intends it to do, the animal must either keep the muscles of the leg and foot in a state of tension much longer than is necessary, or be liable to slip or stumble, through their being relaxed at the moment when the foot reaches the ground; either way being hurtful to the horse.

The frog, in reality, is only a continuation of the

coronet, and from its wedge-like form, and nearly total insensibility to feeling, proves that it is meant to take a bearing upon the ground where it is useful to the animal either in action or in repose. In the former it acts as a buffer, preventing concussion, while its hold upon the smoothest surfaces prevents slipping. In the latter case it becomes a support and a rest, as the horse whose frogs reach the ground can ease the weight of his body from any leg on to the other three, by allowing the pressure to increase or diminish upon the different cushions on which he is standing. Again, when a horse walks upon his frog, it, by his weight, is pressed into the ground, pushing itself as it were into the inequalities it may happen to come in contact with; and thus the animal gains a stronger adherence to the road he is travelling over, combined with a greater feeling of security wherever he goes, than he could otherwise possess.

In structure this portion of the foot may be compared to horse-hair in the compressed state as used for stuffing sofas, and if we can imagine this hair to be mixed with a fatty adhesive substance, we shall form a fair idea what the tough elastic frog resembles when under microscopic inspection. Though thicker than the parts from which it proceeds, the frog is less compact in its texture, and therefore being more elastic it expands and contracts whenever it touches or leaves the ground. The more, therefore, we investigate the form and particular functions of the frog, the more must we feel convinced that its true use is to prevent the horse from slipping, the heels from contracting, the legs from the evil effects

from concussion, as well as to serve as an elastic spring for the horse when in motion, and a *point d'appui* for him when he is at rest.

The sole of the foot, unlike the frog, recedes from the ground; proof sufficient, from its semi-vaulted shape, that it is not meant by nature to sustain much of the horse's weight. Firmly attached to the skin which covers the under surface of the foot-bone, it is joined to the hoof's inside edge by the mere force of cohesion. Its uses, which its construction points to, are principally to protect the sensitive sole which it covers, and by its concavity to act in soft ground like a break, when the laminæ lengthening beneath the weight of the animal, causes the sole to descend, by which means the force of concussion is decreased. Over its surface there is no external glazy-gluey-layer to preserve its moisture, as in the crust; while its fibres, stretched like strings, layer over layer, are as unlike the woolly oily substance of the frog as the horn of the crust differs from the bones which it covers. In one respect the sole resembles the frog, which is, that the outer layer of fibres in each becomes dead and falls off in flakes, the growth downwards of the new horn pushing off the old in turn. There is little difficulty in perceiving how the sole cannot bear so much pressure upon it as the frog, for it is only above the sole that the foot-bones are placed; and as between them and the horn beneath the sensitive sole lies, any pressure must bruise and injure the tender flesh between these two hard substances. Its concavity, very slight at its junction with the crust, gradually

increases as it advances towards the centre of the foot, a form of construction which admits of the web of the shoe resting *a little* upon the sole, without any fear of injury. This fact most farriers, however, will not perceive, and jumping to the opposite extreme, pare away the important thickness of the sole in order that the shoe may not touch it; then when sand, etc., works in between iron and thin horn, they are astonished to find the horse so shod go lame, to relieve which they apply remedies equally if not more injurious.

From the foregoing the reader will learn that a horse may be said to have a foot half cloven, that is to say, a foot having the power of expansion at the clefts of the heel, but confined at the toe. Defended in front and sides by the crust, and underneath by the frog, sole, and bars, the horse's foot in its natural state, and shod upon natural common sense principles, is nearly invulnerable. Where the foot is weakest, namely at the heels, the thick, tough, and elastic frog supplies the necessary support, acting as a cushion for the weight above to rest upon when the front tendons have been overworked. Then, as the sole is not meant to bear much pressure, the crust or wall, from its vertical position, strength, and substance, is not only the great bearing portion, but the only part which will allow nails being driven into it in a vertical direction. Possessing the last quality, it is therefore upon the crust that any protection or armour for the foot must be fixed, as upon the wall and the frog the horse's weight may be said exclusively to fall; and while the former, from its hard brittle nature needs

something to guard it from fracture or too rapid wear, the latter, if unmutilated, from its toughness and elasticity, and capability of rapid reproduction, requires no artificial defence whatever.

This being the case, one would naturally suppose that to insure good shoeing all that was requisite would be to guard the part of the foot that wanted protection. Common sense dictates which portion this should be, and if governed by correct principles, there is attached to the crust a light iron shoe of the exact shape of the horn, and the eighth of an inch wider. I am confident it would be found to answer, providing the shoe was perfectly level, and the foot had been prepared properly. The shoe must not be too narrow, for it will break or twist unless of a certain width, and if too wide it will not only be too heavy and probably press upon the sole, but will have no hold upon the convex stones over which it has to journey. As already mentioned, I believe that the sole at its junction with the crust may and ought to carry some portion of the weight, but that portion is small and should not be exceeded.

Weight is also a most important consideration, which I have previously noticed, for the iron shoe put on any horse or pony should never exceed certain limits in length, width, or thickness, lest the artificial covering, by its superior weight and hardness, break and wear away the natural protection it is meant to preserve, and so the remedy prove worse than the disease.

Unfortunately, farriers cannot be persuaded to look at the subject in this light. Pretending, seemingly, to

prefer rather "to bear those ills they have, than fly to others that they know not of," they decline to change the system which suited so well their sires and grandsires before them. Resembling the farmer who weighed and sold his butter by a stone weighing considerably over a pound, simply because his father had used the stone for the same purpose, and made money by doing so, he refused to change the weight, as it would never answer, he said, for him to wish to appear wiser than his father. The farriers offer precisely similar reasons for continuing their highly objectionable method of shoeing, as they refuse also to be wiser than their ancestors. And such is the constitution of things, that some kinds of businesses are carried on, and occasionally with success, upon quite erroneous principles. It is not so many years back since horses in Ireland were harnessed by their tails, and it took ages to convince the people there that it would probably be more convenient for the animals, and better for the owners, if the former were allowed to draw with their shoulders.

The reader must bear in mind that the hoof, being a continuation of the skin towards the extremities, is continually growing downwards from its roots at the coronet, and it is this which replaces any damage the horn suffers from wear or from accidents, and as nothing intervenes between the coffin-bone and the horn but the laminæ, the adhesion between these two parts is a very close one. I refer here to that portion of the foot from the front to the quarters, to which the points of the coffin-bone reach; but as from there to the heels is

principally composed of cartilaginous substance, it will be readily admitted that this is the part which will most easily allow of either contraction or expansion. Then as the horn of the crust, and especially of that of the fore feet, narrows in width and thins off gradually towards the heels, until it is lost in the skin of the coronary back band, this portion of the hoof is exceptionally weak, and but for the protection which even a wasted frog affords, the heels would be always in danger. The whole substance of the hoof, especially the sole and frog is of an open porous nature, which not only draws in air and moisture eagerly from without, but sends forth from within a continuous insensible perspiration. This perspiration can be easily observed however, if, when the frog is newly pared, the foot is held in the sunshine, when it shows like dew upon the fresh cut surface. Nature having therefore given such guards as the crust, frog, sole, and bars, to the sensitive interior parts of the foot, it seems incomprehensible that men should be found ready and willing not only to cut away these important parts, but actually to declare that what they do, so far from being an injury, is actually a benefit to the animal. Blinded by ignorance and prejudice they cannot or will not see that when the frog is permitted to remain sound and whole, the more it comes in contact with either gravel stones or even sharp flints, the firmer, tougher, and more healthy it becomes; while, on the contrary, when cut with a sharp instrument, allowing the moisture which is its life to escape, it dries up, hardens, cracks, and becomes highly susceptible to every impres-

sion, as well as diseased; in fact anything but a cushion to the inner sensitive parts of the foot.

A horse in health should have a term of existence from thirty-five to forty years. All authorities now admit that animals should live five times as long as it takes them to reach maturity. A dog, which is at its full growth when between two or three years old, is very aged at twelve years. Horses do not, unless their growth is forced, reach their full prime until they are seven or eight years old, which by the same law leaves them to live some thirty years longer. When these facts are kept in mind, together with these other facts that three-fourths of our horses die or are destroyed under twelve years old, that horses are termed aged at six, old at ten, very *old* when double that number of years, and that few of them but are laid up from work a dozen times every year from lameness caused by bad shoeing, the viciousness of a system which entails such misery and destruction of life cannot surely be too strongly commented upon. Bad shoeing has affected owners pecuniarily to a far greater degree than ever "bishoping" did; yet, while the one is a crime, severely punishable by law, the other is regarded as a matter of so little consequence as almost to be considered an impertinence to mention; but it is really the worse offence of the two to owners, whether it is looked at from a humane or a monetary point of view.

CHAPTER II.

THE INTERIOR PARTS OF THE FOOT.

In the human frame the gums are the least sensitive parts, and under the finger and toe nails the most sensitive parts of the whole body. It is precisely the same with the horse, as beneath the horn the parts there are so susceptible of pain, that if a nail only presses upon the laminæ in the interior, the animal becomes lame at once. The excessive pain which most of us have felt, at one time or another of our lives, through having a splinter of wood run under a finger nail, will enable any one to form some conception of what a horse suffers when he is pricked by an incompetent or drunken farrier. Like ourselves, the animal suffers little, comparatively, when the foreign body is at once extracted, and water applied plentifully to the wound; but if allowed to remain even for a single day, it soon festers, and, from being only a slight wound, rapidly becomes a serious sore.

The interior portions of the foot, therefore, are endowed with great sensibility, while, to such a degree of nicety is it adapted to the cavity in the hoof, that it completely fills it without suffering in the least degree from pressure. By this every person should perceive

that whatever tends to decrease the size of the horn box, must imperil the parts which it covers. The internal portions are composed of bones, cartilages, ligaments, muscles, tendons, blood-vessels, and nerves, which, by an insensible but gradual process of natural development, are continually undergoing changes. The sensitive frog slowly but surely becomes the insensitive one, while a similar transformation is going on in a similar manner in all the other parts of the foot. The process of this, in the aggregate, is truly a wonderful one, as, for instance, the horn of the sole which does not touch the ground, when each portion has done its duty, falls off in flakes, while the frog wears off the used parts, when permitted, by friction with the ground; conditions which all tend to keep the foot sound and healthy.

The bones of the foot are known as the coffin-bone, the navicular bone, and the lower pastern bone. The first is so named from being, as it were, *buried* in the foot, and is the principal bone in the hoof, which in shape it somewhat resembles, being of a vaulted form from the ground, broad in front, and tapering gradually towards the heels. Strongest and thickest at the upper part, where a hollow cavity in it, together with a portion of the navicular bone, forms a socket for the bottom part of the lower pastern bone to rest on, the coffin-bone being kept free from pressure, is of material consequence to the whole limb. The concave and arched under surface of this bone allows the blood to pass unimpeded through the numerous veins below it, and being of an open porous nature, it receives a greater number of veins

and arteries than any other bone of its size in the whole body. The very concavity in the shape of the under portion of the coffin-bone is an advantage, as it allows whatever weight descends upon it to fall upon the outer edge or strongest part, besides helping to obviate any ill effects from concussion in other parts, through jumping, etc.

The small bone behind, generally known now as "the navicular," is likewise thickest at the middle, with sharp pointed extremities, and is of a harder and more compact nature than the coffin-bone, upon which, however, it is partly supported. If the reader refers to Plate I., which shows a section of a horse's fore foot and fetlock, he will have no difficulty in discovering how the three foot bones are situated; and if he looks closer he must observe the back sinew (*flexor perforans* tendon) passing under the navicular bone like a roller. I wish this to be particularly noticed, as, when I come to speak of "navicular disease," its prevention or probable cure will be more readily understood. The back sinew is enclosed in a sheath, and this being shown open in the plate, the tendon, or tendons rather, which united under the one membrane, can be seen to insert themselves into the back and beneath the lower part of the coffin-bone, the one entering and the other covering the concave or arched under surface, until they eventually become the fleshy sole, which, as I have already remarked, in turn becomes the horny and outward sole. The *extensor tendon*, or front sinew, passes down the fore part of the leg into the foot, under the annular or circular ligament,

and ultimately inserts itself into the front part of the coffin-bone. It is from the front sinew that the laminæ spring, which surround the coffin-bone on all sides, and by fitting in to the horny laminæ of the crust, become by their muscular action of so much importance in all movements of the horse. I may also remark, as the action of the back sinew is to lift the foot upward and backward, while the front sinew controls the forward motion of the limb, it follows that flexion or bending of the leg must always precede extension; the first being necessary to lift the foot from the ground, without which it of course could not be advanced. Movement being therefore entirely due to the action of the back sinew in each leg, the importance of the *flexor perforans* tendon will be at once recognised.

It will be seen from Plate I. that the blood-vessels within the hoof are very numerous, more particularly two large arteries which run along the outside of the coffin-bone. These, from their exposed situations, are very liable to compression, and therefore injury, from any contraction of the hoof. Accompanying the blood-vessels are nerves which, dispersing throughout the foot, secure a tenderness to the sensitive portions of the foot, that enables the horse to tell, even through the thick horn, whether the ground he passes over is strong enough to carry his weight. Hence the carefulness with which we find horses approach wooden bridges or other structures which vibrate under their feet; and when this is all thought of, the sin and folly of cutting away any portion of their organs of touch must be more and more apparent. A

reference to Plate I. will also inform the reader that the bottom of the internal foot is formed by the sensitive frog and sole, the former resembling in shape the horny frog that covers it, the concavities of the one nicely fitting the convexities of the other, all being united to the outer portion by two elastic cartilages, which in a great measure are protected by the heels and quarters of the crust that cover them. To realise some of the advantages which frog-pressure obtains for the horse that is shod on natural common sense principles, one has only to imagine the foot coming to the ground at each step. Then every time the horny frog touches the ground and receives the pressure of the horse's weight, the sensitive frog above is forced upwards and outwards, causing an expansion of the heels, as well as counteracting the concussion of the blow. It will therefore be seen that however much the foot may be predisposed to contraction from over-dryness of the horn, contraction cannot well take place with such a neutralising agency continually at work to prevent it. The gradations from the extreme sensitiveness of the interior parts to the utmost callousness of the exterior parts, are so slight, that it would be impossible to describe properly where the one terminates and the other begins. Of this, however, we may be certain, that the extent of the latter will depend much upon the thickness of the horn covering by which the foot is encased. If the crust is thinned by rasping, the sole or frog by paring, then the sensitiveness of the whole foot must be augmented, while, on the other hand, if those parts are not unnecessarily interfered with, the callousness is proportionably secured.

I cannot too often impress upon the reader the necessity of keeping these facts continually in his mind, as well as, that whatever injury by contraction, corns, thrush, or sand-cracks, the horse's foot may suffer from, the remedy must be sought for more often internally than externally. Water being the natural appliance, will cause the horn of the hoof to grow faster by the moisture reaching the inner parts, but it is quite an erroneous idea to suppose that the application of tar or grease would have a similarly beneficial effect. What would our opinion be of a gardener who applied manure to the dead leaves instead of to the roots of a plant, in order to renew its growth? Would we not be justified in concluding that he knew nothing at all about his business? Yet this is just what many sensible people do to their horses' feet. They apply tar and other unguents to the hoofs, so as to cause a more healthy growth of horn, evidently losing sight of the fact, that, as the insensible sole derives its existence from the sensible sole above it, and the crust or wall being in like manner the production of the coronary band, and of the sensitive laminae within, neither the sole nor the crust could be beneficially affected by any applications to the bad horn outside. Why we should term the elastic cushion of the horse's foot a frog is one of those eccentricities of our language difficult—even upon the supposition that it is a corruption of *frush, i.e.*, the *fourche* of the French—to account for. The German equivalent is *gabel*, not frosh, their bonâ fide "jumping frog." If the term is a corruption of the French *frush*, we are indebted to the same

word for *thrush*, a designation for a particular form of running sore that discharges from the frog.

Having endeavoured to describe the necessity that exists for obtaining frog pressure, I will now try to represent the sadly hurtful results which follow its mutilation.

In preparing the foot for the shoe, the blacksmith ought only to cut away as much of the crust as has grown from the last time the horse was shod, for the iron rim preventing the wear of horn here, if it was not reduced it would soon get so high as to inconvenience if not lame the animal. But the farrier not only lowers the crust with his knife, he also carves at the frog, and scoops out the sole, until the horn thereon from being a thick, elastic, insensitive substance, has become thin, inelastic, and so susceptible, that if the animal treads on a stone he is seriously and often permanently injured. This method of treatment raises the frog completely from its sphere of action, and so long as it remains in this position the heels are deprived of that pressure which nature has so wisely provided them with, in order to keep the crust in a state of expansion and the whole foot healthy. The consequence of the evil habit of paring away the horn protection beneath can be easily imagined, for the sole being cut away until it springs or bends beneath the pressure of the farrier's thumb, it follows whenever the animal treads upon any thing harder—and even a blacksmith's thumb is not so hard as a pebble or piece of granite—the poor creature "falls suddenly lame," or drops to the ground as if "he had been shot,"

—phrases, unfortunately, too well understood to need explanation. This is only one of the miseries which the horse has to contend against from ignorant and prejudiced workmen. By the bars being cut away, with the erroneous idea that the heels will have more room to expand or open, quite the contrary effect invariably ensues—the heels contract. Then the frog, that large elastic pad, intended by nature for the horse to rest on when not in action, and as a spring or fulcrum when in motion, is ruthlessly sliced away, until the sensitive parts are exposed; and when this has all been achieved, high heel calks are attached to the shoes of the hind feet, and leather soles to those in front, to keep the now tender frog from injury. It appears surprising that many farriers should fail to see all this, as well as that the pressure from the horse's weight upon a padless foot, combined with the resistance supplied by the outer edges of wide iron shoes, forces the heels together, when the whole foot begins to contract, and, if persevered in, permanent lameness follows as a result. But even this is not half the mischief which ensues from such treatment, as it is well known now that navicular disease, ringbone, corns, thrush, and greasy heels, are the common consequences of such insane treatment. In another chapter I will give full details as to how these mischiefs are gradually nurtured and developed, and at the same time will show how opposite treatment has an opposite and directly healthy and beneficial effect. At present I will simply relate what the ordinary farrier does in all cases with the feet, which his mismanagement—to use the mildest term—has made tender.

When the sole has been pared thin, the horse becomes naturally afraid to put his foot upon the ground, so the blacksmith then supplies what he is pleased to term "cover." This cover, a wide webbed shoe, "*nicely dished out,*" is a wonderful looking affair, very suggestive of a broken frying pan, but known to farriers as "*the box-seated shoe,*" and regarded by the trade as an infallible remedy for tender feet. However, as might be expected from the shape and weight of the article, it only increases the evil. This is especially to be seen in drop-soles or pumice feet, the result in ninety-nine cases in a hundred of close paring, when ignorance, blindly ignoring common sense, proceeds to pare the horn of the sole still thinner, while the shoe put on becoming more and more box shaped, the whole foot eventually slips down out of the hoof, and the horse is irrevocably ruined. Common sense clearly shows, when the sole of the foot becomes convex instead of concave, that the sole must be too weak, as it cannot bear the pressure from above; and who but a lunatic, most people will inquire, would ever attempt to lessen the thickness in order to gain additional strength? yet that is exactly what some of our practical farriers proceed to do with feet of this description.

I will add but little more, at this part of my treatise, of the cruelty, I may say sinfulness, of treating horses in so truly barbarous a manner. All cruelty generally originates from some paltry contemptible source, and the cruelty in many cases, of shoeing horses with shoes far too heavy for them to carry, is due often to the saving of a paltry sixpence monthly per horse for shoeing. In

contracts this is notoriously the case, the farrier overloading the horse's feet with iron, so that the shoes may last longer, he being quite careless as to the injury the poor animal receives from the inhuman treatment; treatment, as I have shown, there is not the least necessity for.

If there be no need, then, for such heavy shoes, and no benefit to be derived beyond the paltry saving in the cost of putting them on, surely owners ought no longer to allow their valuable animals to be thus sacrificed. The progress of disease in the foot is so insidious, and the development of lameness so gradual, that, when combined with the natural courageous fortitude of the generous animal, the injury is often not discovered until it is too late for remedy. The noble beast, bearing pain day after day, without flinching, for perhaps months, having to succumb at last, the owner is dumfounded when he learns that his horse is incurably lame. Everything is blamed, usually, but the true one, namely the shoeing. It is said to be rheumatism, a sprain, shoulder lameness, etc. etc., and then the faithful animal, through no fault of its own, is either ordered to be destroyed, or reserved for a worse fate, namely, the shafts of a "fourwheeler."

In May 1869, Mr. Greaves, a florist in Bayswater, showed me a horse of his which had suffered so much from drop-sole and thrush in the fore feet that he thought he would have to get rid of it. Happening to hear how injurious it was to the hoof to rasp, cut, and pare it, he got his farrier to shoe his horse on a more sensible system, and with the most gratifying results. By leaving alone

the frog, sole, and bars, the drop-sole began to disappear and the thrush to grow out, and in less than three months Mr. Greaves informed me the horse was as well as ever it had been.

CHAPTER III.

THE PRESENT METHOD OF PREPARING THE HORSE'S FOOT FOR SHOEING.

FARRIERS are divided into two classes of workmen—viz. firemen and doormen; the duty of the former being to fit the shoes to the horse's feet, and that of the latter not only to prepare the foot for receiving the shoe, but also to nail it on after it has been fitted. From this it will be seen that usually it takes two men to shoe a horse, although one fireman is supposed to fit out enough shoes to keep two doormen at work. I may remark here, however, that though it is supposed "they manage most things better in France," yet, as it takes three men there to make and put on a shoe, the saying quoted above may be considered not to apply to farriery, which must be one of the exceptions that, it is said, go to prove all rules. Like us, the French have their fireman and doorman, but they have in addition another man, whose duty is, by aid of strap and strength to hold up the horse's foot while the doorman operates upon it, nailing on the shoe in a similar style that a carpenter would, had he to fasten one on to a door. This method, to Englishmen, has a clumsy look, besides involving the services of an extra man, who even then must stand greatly in the

other's way. As the buttress is still used abroad, and every evil there practised that we are accustomed to here, it is not desirable to say any more about French horse-shoeing.

Before going further into details, I trust that it may not be considered out of place for me to refer to the prices charged in London and elsewhere for putting on shoes. In towns, as a rule, farriers are well paid for their work; but in country villages the prices given are often perfectly ridiculous. For instance, in Cheshire and Gloucestershire, two shillings and half-a-crown are common charges for shoeing a horse all round; and when the shoeing is contracted for by the year, as is done in many cases, the charges are still less. Now low prices mean heavy shoes and bad work, which bring forth lameness as their fruit; so, eventually, the farrier gains, as these worthies will tell you plainly that the shoeing never pays them, *but the doctoring does.* A farrier near Gloucester told me not long since, when I questioned him on this subject, that "the doctoring paid always a heap better than the shoeing." Whether it would not be more to the owners' (not to say the horses') benefit to pay more for shoeing and less for physic, is an interrogation I need scarcely put. In London, however, the price is five shillings, which, in my opinion, is nearly as much in excess of what it ought to be as two shillings is under the fair price for such work.

Let us see what it costs in London to put on four shoes, I mean what it costs the farrier. Two men make 60 horse-shoes for a day's work, and in the same time

are supposed to put on 32 shoes; so, if we consider that two men in three days make the shoes for, and put them on to, 16 horses, that will be an average approximation.

As the daily wages of these men would be 9s., the labour employed in shoeing 16 horses would be £1 : 7s., and if to this we add 4½d. per shoe for the price of iron, nails, etc.—£1 : 4s. in all—the matter assumes this form:—

Cost of shoeing 16 horses at 5s. each	£4	0	0
Prime cost to the farrier	2	11	0
Profit	£1	9	0

rather too much, in my opinion, either for owners of horses to pay or farriers to charge. A fair price for all parties would be 4s. or 4s. 6d. per horse, in large towns, for shoeing, which would leave a profit of from 20 to 25 per cent on the outlay,—enough to satisfy any respectable tradesman. In the country, where labour and everything else is proportionally cheaper, from 3s. to 3s. 6d. per set would be ample payment; but no horse ought to be shod for less.

When a horse is taken to the forge to be shod, the first act the farrier does is to take up the near fore foot between his legs, and then, with the assistance of the shoeing-hammer and buffer, to knock off the clenches from the nails that hold on the old shoe. This is effected by a smart blow of the hammer on the back of the chisel-like point of the buffer, which, thus cutting off each clench in succession, leaves the shoe at last only fastened to the foot by a few stubs. After this the workman, by means of his pincers, wrenches off the shoe and nails by

a couple of strong twists, a proceeding, however, seldom performed without inflicting some injury to the crust, more or less serious in results. In the next operation the rasp is brought into play, being applied lightly over

Fig. 1.

Fig. 2.

the sole and round the edge of the crust, in order to remove the ragged pieces of horn or injured parts of the wall,—the usual upshot of pulling off the shoe in such a manner.

Under the erroneous impression that if the sole was allowed to remain unpared it would become so hard as to press injuriously upon the sensitive parts that it covers, the farrier removes it with his drawing-knife until the horn is so thin that it bends—or, in technical language, *springs*—beneath the pressure of his thumb. The bars are next cut away, and as these were the stay of the back part of the foot, the consequence is that the heels narrow and the foot begins to contract. The frog now comes to be performed upon, when, under the vigorous application of the knife, this mainstay of the foot soon becomes but a wretched caricature of its former self.

Resembling, when in a healthy state, Fig. 1, by cutting it is speedily dwarfed down to the resemblance of Fig. 2; when the whole assumes the appearance of what certain grooms and farriers are pleased to term "*a clean foot.*"

By the time the doorman has taken the shoe off, the fireman has selected one about the required size from the stock of ready-made shoes hanging on the wall round him, and, by looking at the old shoe, proceeds to convert the other into as close a resemblance of the one taken off as possible. Before iron can be altered in shape it has to be heated, and therefore the new shoe is placed in the fire until it has attained a proper degree of heat, when it is taken out with the tongs and placed upon the anvil. Usually the first thing done now is to raise a clip at the toe, to prevent the shoe slipping backwards when it is attached to the foot. Half-a-dozen blows with the turning-hammer are sufficient to rise and finish the clip; and when the shoe is altered to the size required, by being made wider or narrower on the horn of the anvil, or shorter or longer by cutting off or drawing out the heels, and being made perfectly level, it is in this hot state taken on the point of a pritchel to be fitted.

The foot, which by this time has been got ready by the doorman in the manner described, is now in turn picked up by the fireman, who, placing the hot shoe on the horn, proceeds to fit it by pressing it into the foot until the nearly red-hot iron has burned itself into a level foundation. When the smoke permits him to see the foot, the only thing the farrier looks to is, that the

shoe fits round the inside quarter closely, and the crust generally. Having with difficulty satisfied himself on these points, and cut away the parts of the blistered horn that had boiled up at the sides of the shoe from the heat, the foot is dropped, and the shoe taken back to have the nail-holes opened. This is done by what is styled technically back-pritchelling, or opening the nail-holes from the inner or foot surface of the shoe. This is far from being a commendable practice, as it not only leaves a jagged sharp piece of iron in the middle of the nail-hole, but it makes the hole of a false and objectionable shape. This is the form \/ that a section of a nail-hole should be, and here is the shape)(that back-pritchelling makes it. The disadvantages are evident, as the nail head, in the first place, can only fit close about half-way through the shoe, for the hole, after a certain point, becomes wider instead of narrower; and secondly, the sharp jagged edge here of the iron, together with the play allowed to the nail, soon wears the latter out, or weakens it to such a degree that it breaks easily. A block of lead is all that is required to render back-pritchelling unnecessary.

When the holes have been opened, and the shoe cooled and rasped round, it is turned over to the doorman to nail on. While the fitting has been doing the doorman has either been getting another foot ready, or pointing nails ready for the next part, the attaching of the shoe to the foot. Every farrier is supposed to point his own nails, for those craftsmen have not only each a peculiar method of making horse shoes, but likewise of

putting them on and pointing the nails. This is so well known to be the case, that in a shop where there are a dozen or more men employed, each could pick out horses that any of the others had shod ; and it is quite a common occurrence for a horse to be shod so long by the same man that it goes lame eventually. When this occurs, it is found, as a rule, that shifting the man effects a cure—only for a time, however,—as it is ten to one the new man will make the same mistake the old one did. Many gentlemen will recognise the truth of my statement here if they will but call to mind how, on many occasions, their horses had been lamed by one farrier, and when they sent them to another to be shod, an improvement would result from the change, in consequence of the very reasons I have stated. They will perhaps also remember how short-lived was the improvement, as the compression had not been removed—only shifted. The horse or horses would again fall lame, when the owner, driven from farrier to farrier, is at last driven to despair, or into the belief of the theory promulgated by some, that contracted feet and their concomitant evils, run in the breed of the horses so affected. That this is rank nonsense any intelligent man who has given the subject his attention will at once assert, for it might, with as much semblance of truth, be said that "wooden legs run in some families," as to assert that the progeny of a mare whose feet are contracted will be foaled with contracted feet also.

The shoe now being all ready for fastening on, the foot is taken up in the usual manner again, the shoe

placed properly in its position, and the first nail driven in. This is always one at the toe, and from this the others are driven in in succession outward. When the nails are driven home, each in turn has its point twisted off with the pincers, and then "drawn up," *i.e.*, hammered as close to the foot as possible, when, by a change of position, the farrier gets the foot resting downwards on his knee, and after having rasped down and under the clenches, and round the foot, the clenches are fastened down into the horn. Another rasping all over completes the operation. Each foot having been similarly treated, the finishing touch is given by a tar brush or greasy rag being passed round the hoof, when the horse is supposed to have been skilfully and scientifically shod.

Now, if we but consider the importance of the crust, its thinness at best, its fibrous nature, and the enormous weight it has almost alone to sustain, a more dangerous practice than rasping round the crust at all could scarcely be attempted. I am well aware that many horses have what is termed "stong feet," in which the horn, being thicker than usual at the heels, causes the feet to contract. In such cases the plan is to rasp the hoof down, so as to enable it to expand a little; and as this does ease the feet for a short time, farriers take to themselves great credit for the skill they bring to bear on each case. A little reflection, however, might have enabled them to foresee that the very rasping would eventually but aggravate the evil, for horn, like many other growing substances, always grows more

rapidly by being cut or rasped. The consequence is, that the hoof of a horse gets thicker after each rasping, and of course the interior sensitive portions of the foot inevitably become more and more compressed, until nearly total lameness results. The fact is, that weak feet might benefit by rasping, if the horses could be spared from work for some time afterwards, until the horn had grown again; but for strong feet to be so treated is the most ridiculous thing that can be well imagined.

I have previously drawn attention to the structure or wall of the foot, and pointed out how tenderly it should be always treated; the importance of the gluey, superficial layer that covers the hoof; how this is necessary to a healthy foot, and how its removal must prove prejudicial. I likewise called attention to the tube-like fibres of which the horn is composed; how they can only retain their strength and elasticity while the outer covering is left untouched; giving the reason, that as each tube is filled with an oil-like substance, to the presence of which the crust owes its toughness; that if this is allowed to escape, the chief virtues in the natural horn escape also. Having stated all this and more, it appears strange that, merely for the sake of show, *rasping*, which not only removes the natural varnish, but, thinning the fibres, permits the nutritious moisture inside of them to escape, should for one hour be allowed in any civilised country. The mischief it entails is not confined to brittleness—bad enough all must allow; but it is a law of nature that when any

living structure is deprived of moisture, it becomes heated, and horn, when heated, is a substance that contracts.

Then, again, rasping under the clenches injures *them* in the first place, and rasping over them after they have been hammered down weakens them in the second place, for, being rasped above and below, their breaking is more likely to occur than otherwise, and we all know when the clench breaks the nail becomes useless. I will now try to describe how a horse should be shod.

CHAPTER IV.

THE PROPOSED METHOD OF PREPARING THE FOOT FOR SHOEING, ETC.

If we notice the feet of young horses before they have been shod, we find them for the most part wide and open at the heels, and with a crust of sufficient thickness and strength to admit of nails being driven with safety near the heels even of the fore-feet. The shape of such feet approaches nearly to a circle, but from the animals having only been running in grass fields, where the wear and tear was not equal to the growth of horn, the crust or wall of the feet will be found, as a rule, more luxuriant than the other parts, and consequently they will be rather ragged looking, and perhaps a little out of proportion. If, however, the feet of unshod young horses, running in pasture lands, are looked to once a-month, and the superabundant horn of the crusts removed, so as to bring the frogs well on to the ground, the feet will need no further attention then. Where the ground is hard, stony, and rocky, this cure can be dispensed with, as the animals will always take exercise enough to keep their feet in good condition.

In what follows I make not the least pretence to having discovered a new thing, for the system I advo-

cate has been described by nearly every veterinary writer of importance for the last four centuries. Fiaschi, an Italian, called attention four hundred years ago to the same cruelties practised by farriers in those days, as I do now; and Osmer in 1766, Clark in 1799, Lord Pembroke in 1761, and many others more recently, have been repeating the same story, with unfortunately too little effect. I do not in this treatise aim to tell more learnedly what more able men have related before: I only strive to make what others have written more clear to the multitude, for it is a subject that concerns all,—not a few. I present myself, therefore, simply as one in the crowd, who, sympathising sincerely with the suffering horses are made to endure through ignorance or misdirected ability, is eager to assist in breaking down the wall of prejudice that at present surrounds the shoeing of those noble animals; and in this endeavour I do not at all despair of ultimate success. Most persons will doubtless allow that the hoof or box of horn, when of a circular form, and in a healthy state, is entirely filled by the sensitive parts of the foot, and that the hoof itself is composed of horny, callous fibres, known by the names of crust, sole, bars, and frog; likewise that those parts differ in substance according to the work each has to perform, as well as that all of them depend upon one another for assistance in carrying out each their separate functions.

As I have already stated, the great art in horse-shoeing is how to preserve the foot always in the best condition for work, and that the best means for doing

so is the preservation of the crust in its natural shape, substance, and thickness.

The sole, concave externally, adheres by its edge to the lower part of the crust, principally through pressure, just in the same way as the end remains in a barrel by the tightness of the hoops which gird it. Similarly, if we were to plane the end of a barrel down until it became as thin as pasteboard, the weight or pressure of the liquor inside would cause the end to bulge outwards, in the same way that a "pumice" or "dropsole" appears to do in a horse's foot. Common sense would surely suggest in the latter case that the sole being thin, required strengthening; but not so with our farriers, who pare the weak sole still thinner when they attempt to cope with this disease, ignoring altogether the fact that the chief use of the sole is to protect, by its thickness, the sensitive portions above it from injury.

This is but one sample of the prevailing ignorance that exists among farriers; another is, their destroying the bars by cutting them clean out of the foot. Now the bars externally "a double purpose serve," as they prevent in a considerable degree contraction of the hoof; while, being a reduplication of the crust, they form a strong support to the heels, just where the crust is weakest. As already explained, the uses of the frog are many; for while it acts as a buffer in preventing concussion, it also, by its wedge-like figure, obviates slipping, and by its elasticity acts like a spring, easing every movement of the foot when in action, while it

serves as a cushion for the horse to rest upon when he is standing still. After backing, for instance, if the frog is in a healthy, perfect state, the horse relaxes the strain upon the back sinew, permitting his weight to fall down upon this natural cushion to the foot, which, thus compressed by the ground, will, india-rubber-like, resist all forward motion. So, moving or at rest, the horse, by the aid of the frog, can adjust the pressure upon the wall of the foot by increasing or diminishing the weight thrown upon the elastic pad beneath; and it would be impossible to imagine anything more perfect than is this admirable provision for a firm foot-hold possessed by the horse; which, however, is too often ruthlessly destroyed by ignorant persons, in order to make room for their clumsy contrivances. In short, it not only breaks the force of the blow when the foot reaches the ground, but it assists it off again; while, either in pulling up or when at rest, the animal, by allowing its weight to fall on its heels, attains its purpose and secures ease by the same means.

The bars, as I have already observed, being simply a continuation of the crust, extending from the heels to the point of the frog, should be left in their entirety, as they help by a mutual resistance from within to dilate and prevent contraction at that part. The crust itself is so hard, tough, and callous, that the touch of a feather, or the blow from a hammer, upon a healthy foot, would, be equally unnoticed by the animal. When a horse is made to move forward at a walk, we observe that the movements of the fore and hind feet differ, the latter

being as it were pushed forward surely and quietly, while the former are thrown boldly out to the front, with a kind of pawing motion, which, when they reach the ground seem to clutch at it, as if to pull themselves onwards. The hind feet therefore appear to push and the fore feet to grasp, when the horse is in motion. When about to move, the horse bends its fore leg at the knee, causing the heels to leave the ground gradually, and the foot to become more and more elevated, until the toe, which is the last part that leaves the ground, is lifted for the moment that the foot is suspended. The base of the foot just as it is leaving the ground is nearly perpendicular, a position it retains until the knee is bent to its fullest extent. Then the foot is thrust forward, describing in its progress nearly a semicircle, the toe gradually rising and the heels falling, until the ground is again reached, *now by the heels first.* The hind foot leaves the ground at once, being lifted straight up and then forward by the action of the front sinew, and is placed down nearly flat, and just behind where the fore foot had been.

From the foregoing it will be perceived that horses ought not to wear their shoes out more in one part than in another. Experience, however, tells us that they mostly do, while common sense whispers that such a defect must be attributed more to artificial than to natural causes. And common sense is right, for if an unequal bearing is thrown either upon the heels, the toe, the inside or the outside of a shoe, that portion will wear away much quicker than the other parts. Farriers,

when they find this to be the case, thicken the part affected by putting in a bit of steel ; only to find the undue wear continue as much as before, because the friction by the thickening of the parts had been increased and not diminished. This, however, is not discovered ; the thickening goes on until the horse is completely ruined. Now when an engineer finds any two parts of his machinery unduly in contact, does he thicken those parts to prevent their wearing out ? Decidedly not ; he eases them, and thus gets rid of both the friction and its cause together. Not that the shoe should be thinned but the crust of the foot lowered gradually to and from the part upon which the undue pressure falls.

The two things to be attended to in horse-shoeing of all kinds, good, bad, or indifferent, are to cut the hoof and apply the shoe ; and three points to be considered, namely—the previous preparation of the foot, the form of the shoe, and the manner of fastening it on. Now I have always considered that the preparer of the foot and nailer on of the shoe is a man of more importance than his fellow who receives higher wages for simply preparing the shoe for the foot. But men, nearly from time immemorial, have paid more attention to the shoe than to the foot which it has to be fastened to. Therefore we find that the man who can turn out the nicest-looking piece of hammered iron, is considered worthy of much higher remuneration than he who may have made the anatomy of the horse's foot his study—who knows

to a hair's breadth where to drive a nail, and how much horn may with safety be removed from the hoof.*

This error, this striving for appearance to the sacrifice of utility, has done more mischief to veterinary art than aught else, for the best formed shoe ever turned out of hands, if nailed to a foot improperly prepared, would do far more injury than the most ill-shapen, ill-made piece of circular iron could ever do, so long as it was fastened carefully to a hoof that had been prepared with judgment.

When a farrier has a horse to shoe, his first duty is to examine all the four feet, one by one ; noting, in turn, any peculiarity of each as regards signs of threatened contraction, etc., in the feet, and the existence of undue or unfair wear in the shoes, making up his mind what steps to take so as to remedy the evils.

When he had done this, he would pick up his shoeing hammer and buffer, and, taking hold of the near fore-foot, and placing it between his knees, proceed, with the help of those tools, to knock off the clenches. Then taking up his pincers, using them as a lever, and the sole of the foot as a fulcrum, he should gently loosen the shoe by laying hold of it at each heel in succession, so as to draw it clear of the foot about half-an-inch. If the shoe is then struck with the pincers sharply, back to its place on the foot, the nail-heads will

* This was proved at a Cattle Show in the West of England, held in June this year, when a boy of 15 took the first prize for horse-shoeing, simply because he had turned out the nicest-looking shoe.

remain clear, when each of them can be drawn out separately. By this means the horn of the crust would not be injured through the removal of the shoe, and if

Fig. 3.

A NEARLY PERFECT FOOT PREPARED FOR SHOEING.

A A A.—The sole of the foot.
B B.—The Bars.
C C.—The Frog.
D D.—The Seat of Corn.
E E E.—The part on which the shoe is placed.
a a.—The Crust or Wall of the foot.
b b.—The junction of the sole and crust.

necessary, the new nails could perhaps be driven into the old nail-holes, without detriment either to the crust or to their holding powers—points of more than ordinary importance.

With an animal that had never been shod previously, the lowering of the crust all round would be the principal matter for the farrier to attend to, his first object undoubtedly being to get the frog upon the ground; the

heels would require to be lowered if possible until that end was fully attained. Then, shortening the toe sufficiently, the horn at the quarters would next be removed until there was a complete level bearing all round the crust,—the seating to be no wider than the web of the

Fig. 4. Fig. 5.

shoe. It would be requisite to remove as much of the crust as would be replaced by the shoe, so that, when the shoe was on, the frog would still take a full bearing upon the ground. If this could not be quite managed in consequence of the foot being over fleshy, the shoe could be drawn out gradually, or thinned, from the quarters to the heels, until the constant pressure and wear of the frog upon the ground had induced a fresher and fuller growth of the frog, when the tapering off of the shoe heels could be discontinued. (*See* Fig. 5.)

I have given here two examples of what I refer to. Figure 4 shows the hoof shod with a narrow webbed shoe, and the heels lowered so as to admit of frog pressure. Figure 5 is shod with a shoe drawn out thin at

the heels, so as to induce frog pressure when the crust could not be lowered any further.

If the width of the shoe had to be regulated by the width of the crust, shoeing would be a still more difficult process for the farrier to become master of than it is at present; but fortunately such is not the case, as the sole, from its concave form, is able at this part to take a small portion of the weight, but that portion, as already stated, is but small, and must not be exceeded. No regular width can be given, as so much depends upon the nature and shape of the foot; a horse with a flat or pumice foot, for instance, could not be shod with so wide a webbed shoe as one whose foot was more hollow. As a rule, however, the web should be about one-third wider than the crust, the size of the horse determining what the former may be, as a pony might only require a shoe $\frac{3}{8}$ of an inch wide in the web, while a carthorse would need one three times as broad.

Having got the foot prepared ready for the shoe, the fitting of the shoe follows, which, in my opinion, can always be done when the iron is cold better than when hot. I'll allow that heating the shoe is the quicker way, but it is also the more barbarous one. The mischief done at times by this custom was exemplified some years ago in the case of Mr. Bevans' celebrated trotting horse, "Hue-and-Cry," which lost both his fore feet through the shoes having been fitted red hot; and many animals, both before and since, have suffered like misfortunes from the same cause. The whole matter simply resolves itself into a question of some ten minutes longer being re-

quired to shoe a horse in the humane way than in the other, and surely that will not be allowed as a sufficient reason for the continuance of such brutality as burning an iron shoe into a foot undoubtedly is. I am aware that farriers assert they can fit a shoe much closer to the foot by burning it into its place, which is feasible enough, and if this was managed with care there would not be much harm done; but the red hot shoe is oftener used as a means to remove superfluous horn, than to bed the shoe, and it is then the injury is accomplished.

When the crust has been sufficiently lowered with the knife, and rasped round level, and the shoe is seen to be perfectly level also, from having been tested on the flat part of the anvil, a very little more trouble will ensure a fit quite as perfect as the burning-on process. The farrier has only to rub some lamp black or red ochre round the web of the shoe, and place it to its place on the foot, holding it there for a second, and when he removes it the parts where undue pressure fell will be marked enough for him to judge how much has to be rasped off, and as he will have both hands to hold the shoe with, instead of having it balanced on the point of the pritchel, like a muffin at the end of a toasting-fork, he will in a short time be able to fit a shoe far better by the new plan than the old. Hot shoes likewise shrivel up the horn, causing it not only to shrink but to become dry, hard, and brittle. When a horse is shod for the first time, it may be requisite to keep the shoe warm, so as to make any alterations, as there would not be the old shoe for a guide; this, however, need only be the

exception not the rule. The shoe being fitted correctly, all that remains now to be done would be to nail it on. If the nail-holes have been punched *coarse*, as it is technically termed—*i.e.*, in the centre of the web, they ought also to be punched straight through, that is, brought out in the centre of the web on the other side. I ought perhaps to remark that what I state here has reference to the shoes I recommend—viz. narrow webbed ones. As a rule, however, farriers generally punch the nail-holes much too near the outside, for fear of pricking the horse, but with feet that a rasp never touched, nor had been even mutilated in other respects, there would be no such danger. I consider five or six nails are sufficient to hold any shoe, if they are not enough, twenty would not be too many. Although there is most horn at the toes of the fore feet, nails should never be put too far forward, as the leverage at the toe breaks them, besides the chance of the nail-head being worn off from the greater friction at that part. I need scarcely add that nails should not be driven any way near the heels of the fore feet either, more especially the inside, the crust there being exceptionally thin.

I have purposely refrained until now from mentioning heel-calks, considering them as I do the fruitful source of much of the misery the horse has to endure. Certainly, next to the cutting away of the frog, the elevation of the foot from the ground is the most prolific cause of disease. Wearing heel-calks on a plain surface, a horse's foot is always thrown forward on the toe, out of its proper bearing, which is very liable to make the horse

stumble. There are only two arguments that their most strenuous supporters can urge for heel-calks to remain in use, and these are—they prevent a horse from slipping when he is going down hill, and they assist him to back. With regard to the first, I am of opinion that it would be far more preferable for a horse to slip a foot or two forward when going down hill, than, with a heavy load behind him, to be pulled up suddenly, through the calks getting caught in the pavement, and thus strain the muscles of his back or the back sinews in his legs; and with respect to backing, there is nothing can be more complete than the admirable provision he has in the frog for such a purpose. When the foot is in a perfect state the horse, after backing, relaxes the strain on the back sinew, and lets the weight down on the cushion of the foot, and so retains a far firmer hold of the ground than any iron projection from the shoe could give him. Nothing in art can be so perfect as the natural firm foothold which the frog provides for the horse; and certain am I there is no more painful sight in London for man to look at, than is to be seen daily in Ludgate Hill, when horses, any way heavy laden, are coming down it. The mute helpless appeal the poor animals make from their eyes to us their masters, as with legs rigid, and feet held close together, they allow the weight behind to push them on—slipping, sliding all the way, is far beyond power of mine to depict. I can only raise my voice against such cruelty, and hope that soon a different and more humane system of shoeing will have become general, so that one may pass through

the streets of our large cities and see horses at work without being subjected to an agony of pain by witnessing the concentrated misery these animals have at present to undergo.

It is even worse in Lancashire and other parts of the north of England, where horses are propped up, as it were, on short stilts, having calks both at toes and heels. Without taking into consideration the extra weight which the horse has to carry, anyone can imagine how insecure the animal must feel when walking on these tripods. We can easily fancy how we should feel ourselves if compelled always to walk about in pattens, and yet I doubt whether we should feel more miserable than those horses do who are treated so; we should at least know the reason, whether it was fashion or folly that had ordered the affliction, a sort of satisfaction that these poor creatures are debarred from ever finding out. Some may think I express my feelings too strongly on this subject, but it is ever before my eyes; for I cannot move out of doors without being obliged to witness horses, on all sides of me, in suffering either from bearing reins or bad shoeing; and if the poor creatures, when in pain, squalled as cats do, when hurt, legislation would soon step in to stop the noise, by making it compulsory for farriers to know their business properly, and the use of bearing reins a crime punishable by law. The very day I penned these lines—when going down Cannon Street I saw a horse fall so suddenly that the pole of the vehicle in rear passed through the back of the four wheeler he was drawing. The poor animal never tripped,

his legs flew from under him to the right, and he fell upon his left side, the wheels of the cab only being stopped by the horse's body. The number of the cab was, I think, 9689, and the horse was shod with shoes that had high-heel calks, which, as the pavement runs cross-ways only, assisted the poor creature to fall. This is no solitary instance; on the very Friday previous, when walking from Holborn Circus to Newman Street, Oxford Street—about a mile, I saw no less than five cab-horses down, all of them falling—as if they had been shot dead—on their sides. The streets, after being watered, or a slight shower having fallen, are as slippery as if they were covered with soft soap, and horses with high heel-calks and wide webbed shoes are quite helpless upon the granite pavement. Those I saw fall could not get up until rugs had been spread in front of them, so that they could get a foothold and keep it; they would never have got up unless. Would they have fallen at all had they been shod on humane and common sense principles? I think not. It appears strange that there should be so many ridiculous and absurd methods of shoeing, when a little reflection upon the structure of a horse's foot, with the aid of common sense, would surely suggest the proper one.

In concluding this chapter, I cannot do better than quote the words of John Lawrence, who, seventy-seven years ago, urged upon gentlemen the necessity of themselves acquiring the knowledge they are now content to leave to their servants—far too important a trust I consider to be confided to them. "There are some toils" (he

writes) "to which even the rich must submit. True knowledge is not to be acquired, or the acquisition to be enjoyed, by deputy: and if gentlemen and large proprietors of horses are desirous to avoid the difficulties, and dangers, and cruelties, perpetually resulting from prejudice, ignorance, and knavery combined, they must embrace the resolution of making themselves so far masters of the subject as to be able to direct those whom they employ."

CHAPTER V.

ABOUT THE TOOLS FARRIERS USE.

Since the days of Tubal Cain down to the present hour there has been but little improvement in the primitive tools employed by the smith in his special industry. Then, as now, doubtless a pair of bellows, an anvil, and a hammer formed the furniture of a forge, and unquestionably then, as now, there was plenty of room for improvement, not only in the few appliances but in the workmen themselves.

It is not, however, within the scope of these observations to speak much of the past, their object being to describe things as they are at present, and to hope for an improvement of those matters in the future. Having premised this much, I will now endeavour to give an account of the different tools used in the making of horse-shoes, and in fixing those shoes on the horses' feet.

Iron, from its cheapness, ductility, and durability, has been the substance used certainly for four hundred years as the artificial protection to the hoof of the horse, and this having to be fashioned to a certain shape and thickness, a hammer, anvil-pincers, and a fire, are necessary to convert the iron into the requisite form to cover

the foot. There will be no necessity, however, for my entering into the process gone through of making a shoe, nor yet to describe a common bellows, an anvil, a sledge-hammer, tongs, pincers, rasp, etc., as nearly everybody connected with horses has in their time seen hundreds of shoes made as well as put on. I will therefore confine myself to giving a short description of each tool used, and supply drawings of the more important ones, the names of which will be found on Fig. 6.

The tools and appliances used by farriers are as follows, viz.—

The anvil.
The vice.
The sledge-hammer.
The turning hammer.
The shoeing hammer.
The stamp.
The pritchel.
The bellows.
The bench.
The heel-cutter.
The toeing knife.
The drawing knife.
The searcher.
The pincers.
The buffer.
The rasp.
The tongs.
The toolbox.
The water-trough.

If to these I add an apron, hone for sharpening the knives, and the block for pointing the nails, I believe I have named everything that a farrier needs in his way of business. The anvil is used to beat out and turn the shoe upon when in a hot state, this being done by two men (or three) one using the sledge and the other the turning hammer, the latter holding the hot iron all the time with the tongs. When the shoe has been put into shape, the stamp, a short-looking chisel with a willow-rod fastened round it, is used to punch the nail-

holes. Sometimes a groove is first let in with a short, wide chisel, this is termed fullering, but is thought by some to weaken the shoe. After the stamp has been used the pritchel is brought into play—which is only a longer chisel with a point the size and shape of the heads of the horse-nails. In using this tool back-pritchelling should be avoided, as it is apt to "neck the nail." The pritchel should always be inserted from the ground side, but this is seldom done, for, as in other matters, farriers are not easily made to change their ways, even when it is evident to themselves that their method is radically wrong. The shoe is finished and fitted out with the turning hammer, the side part of which is used for raising a clip at the toe or sides of the shoe. The vice is used to hold the shoe when it is being filed up previous to its being put on, etc. The water-trough is to cool the shoes in previous to being nailed on, as well as to cool the tongs if they should get too hot to hold through being used. The shoeing hammer is to point the nails, and nail the shoe on, and level down the clenches. The pincers to pull off the shoe and draw up the nails previous to their being clenched. The use of the buffer is to knock off the clenches with the wide part, and to knock out any old stubs in the foot with the other. The heel-cutter, which fits into a hole in the anvil, is, as its name implies, for cutting off the heels of the shoe. The toeing knife, usually made out of an old file, is intended for shortening the toes, and, when used with circumspection, is very serviceable for lowering the crust at the heels, and for opening the heels.

"The drawing knife"* is used in lowering the crust, and opening the heels, while "the searcher" is principally

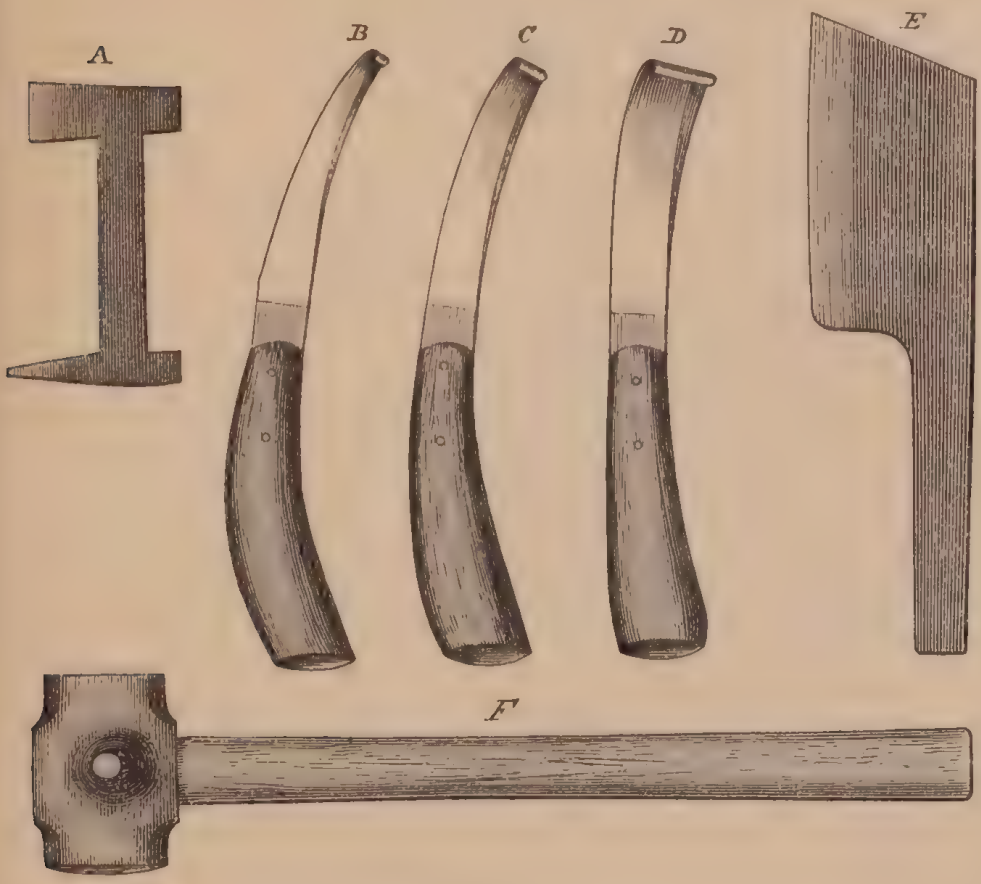

Fig. 6.

FARRIER'S TOOLS.

A.—The Buffer used to knock off the clenches, previous to removing the Shoe from the Foot.

B.—The Searcher.

C. and D.—Drawing Knives for lowering the Crust.

E.—Toeing Knife.

F.—Turning Hammer.

meant for cutting out the foot when diseased, or when it has been pricked, or to search for corns, etc. The rasp

* I have given figures of two drawing knives, they are both used, some farriers preferring the one, and some the other.

is used for levelling the seating for the shoe, and likewise after the old shoe has been pulled off. It is also greatly but injuriously applied to the clenches, rasping them down as it is termed, as well as over the outside of the crust, with an erroneous idea that it is an improvement.

The fuller—as its name implies, is for fullering or making a groove round the edge of the shoe for the nail-heads to fit into. The Rodway shoe and some of Gray's are fullered shoes. The alleged objection to fullering is that it weakens the shoe, a fact that most authorities disagree upon. Some assert if the groove is cut deep the iron is liable to crack in the outward edge of the fuller, and if it is superficial it affords no security to the head of the nail, the only reason for its being made. Others assert the contrary. The fuller, however, if filled up as I recommend in the last chapter but one, becomes a source of strength instead of weakness.

CHAPTER VI.

THE PRESERVATION OF THE HOOF.

HAVING described what the farrier's duty ought to be as regards *his* treatment of the hoof, I now wish to discuss what the groom's obligations are, so far as stable attention to the feet of the horse is concerned.

There are two essentials, and very important ones, to be attended to in the treatment of the feet by grooms—which are, cleanliness and coolness; for unless the hoofs are kept clean and cool, the pores in the horn will get clogged up from the first cause, and it will become hard, dry, and brittle, from the second. Now, as the rules to obviate these are simple in the extreme, any one who neglects to follow them must either be guilty of gross mismanagement or of equally culpable ignorance.

The two rules for keeping horses' feet healthy, and preserving the horn, are, "*use nothing but water to the hoofs—either as a cleanser or an ornamenter; and never allow horses to stand in the stalls upon litter during the day.*"

I have already observed that the hoofs of horses are porous, and that imperceptible perspiration is carried on through these pores, in precisely the same way and

according to the same laws as take place in other parts of the body. Now it is a well known fact that if oil is applied to the human skin perspiration is prevented, and in the east, and other parts of the world, where oiling the skin is practised by the inhabitants, the practice is frequently attended with fatal consequences. The same holds good with respect to horses' hoofs, for grease or tar, by shutting up the pores in the horn, prevents the natural moisture from reaching the surface outwardly, and the air from circulating inwards,—consequences which act upon the horn with ruinous results.

If you tell a groom what is sure to happen from this pernicious habit, he will triumphantly inquire—how oil or grease, which softens leather, can harden horn? and when you explain to him the difference between the nature of the two substances—pointing out the distinction that exists between the dead and living parts of animals; how the latter having juices, etc., necessary for their nourishment and support, require no applications to prevent them from drying, decaying, or rotting, as the former do, he will either refuse to listen to your arguments, or laugh at them, as being the height of absurdity.

Another equally baneful habit is the stuffing, or "stopping of horse's feet" (as it is termed), with hot greasy mixtures or cow-dung, under the idea of softening or cooling them. Of the various prescriptions recommended for this purpose it will be needless to give more than one example, which I take from a very recent book,*—where

* *Horses, how they ought to be shod*, p. 45. Published 1869.

it states one of the best compositions we have found, for the purpose of applying to the feet, is the following—

Tar . .	2 lbs.
Bees wax .	1½ lb.
Honey . .	1 lb.
Suet (Beef or Mutton)	2 lbs.
Whale oil .	4 lbs.

The above ingredients to be mixed and slowly melted together in a hot water bath. It should be applied freely to the sole and wall of the foot by means of a small brush, at least once or twice a-week. Now, I have no hesitation in saying that if this advice was followed strictly, and instead of the "*at least* once or twice a-week" it was applied *daily* to the feet of any horse, that that horse would in six months scarcely have a morsel of sound horn to nail a shoe to. The prescription given above has not much originality about it, as Sir William Hope, in his translation of Solysell's *Perfect Farrier*, recommends a mixture of "honey, tar, and tallow"* mixed together, as an "effectual and cheap remedy" to make the hoof soft and tough. One hundred years ago Bartlett recommended as an ointment for the hoofs—

"Bees wax . .	2 oz
Lard . . .	6 „
Tar . . .	1 „

and as much neat's-foot oil as will make it the consistence of a smooth ointment." †

All such appliances are injurious in the extreme, and

* *Perfect Farrier*, p. 280. Published 1717.

† *Gentlemen's Farriery*, p. 300. Published 1770.

cow-dung, from its well-known restringent qualities, not only drys the horn but rots the frog. If plenty of water, and water only, be applied to the hoofs, and the farrier be debarred from using the rasp and cutting the horn away, I will guarantee that the hoofs will be preserved in their sound natural state. In this way a free and equal perspiration would be kept up, by which the natural nourishment of the hoof, not being interfered with, that constant cohesion of the parts which constitute a firm, sound, and tough hoof, must follow.

I now come to the too common custom of keeping horses constantly standing upon dry litter in the stable during the daytime, which, as it overheats the hoofs and legs (these being found always to agree best with coolness and moisture), the treatment is exceedingly hurtful. If there was any advantage in keeping horses littered down, such as that they needed every moment's rest which could be afforded them, I should be very loathe indeed to interfere, but knowing as I do, and as everybody else does, that horses require no more ease than their natural rest at night gives; that in fact this bedding-down by day is either for display in well-regulated establishments, or else as a screen for dirt and a premium on laziness in situations where orderliness is less thorough, I am the more astonished at its continuance. If it was not well known to all, that horses while they are running in the fields have their hoofs in a better condition than those that are kept hot and dry in the stable, we would not be surprised so much at the continuation of this really mischievous practice, but with

such facts before us, it is certainly as wonderful that these valuable animals should be made to injure themselves by standing on hot litter, as it is that greasing their hoofs should be permitted, with the insane view of improving the horn.

No better example could be given as to the advantages the animals gain from *not* being treated so, than what is given by our cavalry horses, where grease being difficult to be procured, and the horses are not allowed to be bedded down during the day, diseases of the feet are much rarer among the troopers' than among the officers' chargers, where the entirely opposite system is carried out.

Water, and no stint of it, to the horses' legs and feet, with clean swept out well-ventilated stables for them to stand in during the day, will find its reward in the increased health of the animals, as well as in the wholesome soundness of their hoofs.

Lord Pembroke's words upon this subject are so much to the purpose that I willingly quote them: "Standing on litter," he said, "is a bad custom; the constant use of it heats and makes the feet tender, and causes swelled legs; moreover, it renders the animal delicate. Swelled legs may frequently be reduced to their proper natural size by taking away the litter only, which, in some stables, where ignorant grooms and farriers govern, would be a great saving of bleeding and physic, besides straw. I have seen, by repeated experiments, legs swell and unswell by leaving litter, or taking it away, like mercury in a weather glass."

In proof of the advantage good ventilation confers, I need only mention that when horses are, as at Aldershot each summer, put into canvas stables, their health is far superior while there than what it was previously to going into and subsequently leaving that description of shelter. With respect to the common opinion that washing down a horse's legs gives them cracked heels, I can only state that I have known horses sent on provost duty in that camp with very bad cracked heels, who yet never failed to get well in a fortnight, although out till midnight, and exposed to all weathers. The treatment, so successful in their cases, was being rode into a pond, up to their girths, every night on coming off duty, fed, and left to dry.

CHAPTER VII.

OF DISEASES THAT MAY BE ATTRIBUTED TO SHOEING.

HERE I wish to mention only those diseases which I consider could be prevented either by preparing the foot for the shoe on natural and common sense principles, or by applying a shoe suitable for the hoof to carry; and when I mention that not only corns, thrush, quittor, cutting, sand-cracks, ringbone, greasy heels, and contracted feet, come within this category, but also navicular disease, and drop-sole or pumice feet, it will be perceived that something like three-fourths of the complaints that horse-flesh now appears to inherit are in reality preventible; the importance of the matter will be at once conceded.

Corns in horses' feet are not always due to bad shoeing. On the contrary, their cause can mostly be traced to that pregnant evil—contraction of the horn; for when contraction has set in, the hard hoof presses upon the points of the coffin-bone, and it is this pressure which, in my opinion, produces corns. Doubtless pressure upon the heels, from the shoe being improperly put on, will cause corns, as what produces them in the one case produces them in the other. In the first instance they are a consequence of pressure of the sensitive part of the

foot that lies between the points of the coffin-bone and the horn, and in the second instance they result from the pressure of part of the sensitive sole between the iron shoe and the points of the coffin-bone. In Fig. 3 I have marked the seat of corn, and I may add that they are nearly always to be found afflicting the fore feet, and are to be met with generally at the inside heels of the fore feet. Now, as the horn of the fore feet is not only thinnest at the heels, but is usually thinner inside than what it is at the outside heel, my theory as to the cause of corns will be readily understood, the thin horn being the most liable to contract. In the hind feet, where the horn is thickest at the heels, we rarely find corns, which is another proof of my assertion; but as an ounce of fact is worth a pound of theory, I will give a case in point as evidence of the truth of my statement.

I should, however, before going further, explain how they can be prevented. I have already drawn attention to the necessity existing for frog pressure as a preventative to contraction; and if we remember that it is the thinness of the horn at the heels of the fore feet which makes contraction there so easy a matter, it stands to reason that this very slimness will help the heels to open if frog pressure is permitted. Therefore if the frog is allowed to take its bearing upon the ground, every step of the horse will assist to open the heels, and consequently lessen the pressure upon the points of the coffin-bone, when the bruised part would soon get well after the cause ceased to exist.

Now for my ounce of fact. On the 15th of February

1870 I saw a horse named "Captain," belonging to Messrs. Jarvis and Haggar of the Berkshire Brewery, Windham Road, Camberwell Road, London, which had come in the previous night very lame on both fore feet, and had lain down as soon as it got into the stall. When I arrived the horse was still lying down, and, finding the feet very hot, I sent for the farrier—a man named Norris, of the Camberwell Road, a painstaking clever workman—and had the fore shoes taken off, and, as I expected, found a bad corn at the inside heel of each fore foot. Fortunately the horse had goodish frogs, and not overfleshy flat feet; and so I had the heels well lowered, the corns cut out and dressed, the bearing of the shoes removed off the heels,—in fact the whole weight made to fall upon the frog, which, when the shoes were fastened on again, was a good quarter of an inch nearer to the ground than they were. Mark the result: this very horse ("Captain"), that had been troubled with corns for a long time previously, has never suffered from them since —now going on three years; but that is not all,—his feet, which were formerly of an oval shape, have now got circular, and the horse's appearance and health altogether have improved in like proportion. In horses that have flat low heels, corns may arise from too great a pressure upon the sole, in consequence of a too wide webbed shoe, or from its not having been fitted level. In such a case the bearing must be taken off the tender part, and, if possible, the heels lowered more, in order to get the frog nearer to the ground, when the corns would speedily disappear.

"Thrush and greasy heels" are likewise, in my opinion, attributable to the same causes,—contraction, and standing upon litter in the stable, although this is not every one's idea I allow. Some people even consider that there are horses which running thrushes and grease benefit, as drainage does marshy lands, carrying off the bad humours in the blood. I have been told often that grease if cured in one place must break out again in another, and probably assume a more dangerous form; and, therefore, that the discharge at the heels should be rather encouraged than otherwise, so long as it did not prevent the horse from working. It is very sad to have to listen to such arguments, as the pain and torture the poor animals must suffer from such credulous ignorance cannot be imagined, far less described.

I will speak first of the evil effect standing on hot litter has upon the legs. It is well known that while heat attracts or draws the blood to any part, cold has an opposite tendency, as, for instance, when we have a Turkish bath, cold water is usually *douched* over the head, to prevent an overflow of blood to that part from the extra heat the body is subjected to. Litter has the former effect upon horses, its constant use effectually heating the feet and making them tender. Swelled legs may frequently be reduced to their proper size by taking away the litter only; and it has been seen by experiments made that "legs would swell and unswell, by leaving litter or taking it away, like mercury in a weather-glass."

Contraction sets in in various ways, occasionally by both heels drawing near together, driving the frog into

the foot, which, losing shape, eventually becomes as large, if not larger, round the coronet than at the base. Then, again, one heel (generally the inner, in consequence of its thinness) contracts more rapidly than the outer, when corns at that part become inevitable. In other cases the contraction begins at the coronet, when the form of the foot gets entirely changed, becoming either rapidly wider and more of a bell shape as it grows downwards, or it gets long and narrow, the horn obtaining a great thickness towards the toe, and having a tendency often to turn upwards. In the last-named instances the hoof assumes a grooved appearance, resembling an oyster-shell a good deal (see Plate II, Fig. A, *Frontispiece*); and when feet have reached that state their chance of recovery has got to be very small indeed. Visitors to the International Exhibition of 1871 may recollect seeing there an expanding horse-shoe. It is not of the shoe I am going to speak, but of a natural hoof which lay alongside this patent horse-shoe, and was intended to show the description of contracted feet the shoe was supposed to remedy. The poor animal to which the hoof belonged had evidently "cut" or "brushed" in travelling, and the farrier, to prevent this, had rasped so much away of the inside horn that it actually was no thicker at that part than a piece of cartridge paper. The result was, that the inner half of the foot folded over, or rather under, the outer half, in a very remarkable way, which I can only describe by comparing it to the human hand, if a person was to try to cover up the palm of his hand by squeezing the lower part of the thumb and the outer edge together. The

lower part will then project across the palm as one half of this horse's foot did. What must that poor creature have suffered before death put an end to its misery?

In Plate II. (*Frontispiece*) I have shown a perfect crust and an imperfect one. The former, marked B, is nearly circular in shape, the crust perfectly smooth and regular, the frog resting upon the ground as well as the shoe, the sole concave, the coronary band even and decided in form, and the *ruggæ* into which the sensitive laminæ expand or contract from, at every step of the horse, can be plainly perceived. The latter, marked A, is of a scoop-like form, the crust being rough, and with irregular rings projecting outwards and downwards, the coronary band scarcely perceptible, great disparity in the thickness of the horn, which, unnaturally thin at the heels, is in proportion more immoderately thick at the toe, the sole convex instead of concave, the whole, in short, being as unlike what it should be as can be well imagined.

The hoof, I need scarcely repeat, consists of the wall or crust, the sole, the frog, and the bars. When we examine one that has been recently separated from the foot, as shown in Plate II., a great number of small perforations may be observed in the groove inside of the coronary band. Into these pores flow the secretions which supply the horny matter, while at the same time a thinner substance descends, and covers the whole of the external surface of the crust, and this, by preventing undue evaporation, keeps the hoof cool and moist. The crust, therefore, grows from the coronet, taking as it descends a conical shape, so as to cover correctly the bones,

nerves, and muscles beneath it. In a healthy foot, as shown in the plate, the crust is much wider at the base than at the coronet, the frog large and well developed, and the sole strong and arched.

This describes only the healthy foot. To make the hoof take another shape we have only to remove the bars, cut away the frog, and pare the sole, when, according to the work the horse has to do, his feet will take their formation. A riding-horse, doing easy work, would, under such treatment, soon suffer from contracted feet; while the feet of a heavy draught-horse would not only become narrow at the heels, but flat-soled, or, as it is termed, "pumice" or "convex" footed. In certain cases the crust loses its proper form, becoming flatter, besides the horn growing unnaturally thick at the toe, and in time assumes the scoop-like shape marked A in the plate.

It is so difficult from any written description to realise what bad shoeing and bad stable treatment will bring a horse's foot to resemble, that I have given a drawing (Fig. 7) here of a pumice foot which belonged to a horse once the property of the London and South-Western Railway Company. Its dimensions are given in the plate, and, if compared with any healthy foot, it will be at once perceived that the interior sensitive parts of the foot must have shrunk, from the compression of the horn, to less than one-half their original size, while the form of it, from the same cause, had outrageously altered. The horn at the toe got to be simply a solid 3-inch block, while at the heels it was not $\frac{1}{8}$th of an inch in thickness. As an example of what bad treatment of the horse's foot

will often culminate in, this is a very good specimen, while, unfortunately, it is no rarity,—the foreman farrier of the railway company having several specimens similar to the accompanying drawing.

Fig. 7.

SECTION OF A HORSE'S HOOF—REMARKABLE SPECIMEN.

A B.—Length, 7½ inches.
D E.—Depth, 3¼ inches.

In this specimen the growth of horn at the toe is something extraordinary, while the almost total disappearance of the interior ridges, into which the sensitive laminæ should expand, is equally remarkable.

If farriers would but reflect that the horse's hoofs are constantly growing,—the crust being produced by the coronary ring, the horny sole by the sensitive sole, and the horny frog by the sensitive frog,—that all these are elastic, and have motion,—and that whatever injures the outer parts must injuriously affect the inner portions,—they would surely be more careful and circumspect in their treatment of horses' feet. They know, or should know, that the weight of the horse is sustained by the internal and superior part of the crust, the laminæ connecting the coffin-bone to it in such a manner that the principal portion of the horse's weight is thus suspended to the inside of the hoof.

A reference to Plate I. (*Frontispiece*) will make my meaning perhaps more easily understood. From that it will be perceived, when the weight of the horse, falling in turn from the lower pastern bone upon the coffin and navicular bones, pressing them downwards, that the laminæ lengthen, forcing the crust downwards at the same moment; and as these bones descend the horny sole also descends slightly, and flattens, compelling, with the upward pressure from the frog, the heels, quarters, and bars to expand or open outwards. When the weight is removed by the animal being in motion, these parts again contract as the foot leaves the ground, thus producing contraction and expansion alternately. Now, as the extent of this motion depends on the thickness and power in the crust to sustain the weight of the horse, the difference between a strong hoof and a weak one will soon tell. The former, so long as it is treated on sound principles, will continue to present a regular slope from the coronet to the lower part; whereas the other, treated differently, becomes hollow, wrinkled, and flattened at the sole, as is shown in Fig. A, Plate II. (*Frontispiece*), which represents an indented distorted hoof, instead of a perfect pillar of horn, as it should be.

Contraction, then, has a remarkably ill effect upon the horn of the horse's feet. In cases of thrush and of grease, it, by stopping the free circulation of the blood, causes humours to collect, for which there is no vent save through the fibres of the wasted frog, or by the thin porous skin above the heels. In thrush the contraction prevents a sufficient supply of blood from reaching the

sensitive frog that produces the insensible frog, and so, it becoming useless for the purpose nature intended it, instead of coming to horn it oozes out a noxious-smelling fluid. With grease the evil is caused by the accumulation of blood from the arteries, which the contraction of the hoof prevents the veins from carrying back to the heart, occasioning thereby the swelling at the heels, which eventually becomes the collection of cankered sores which we know under the name of "greasy heels." The only preventative and cure for these is frog pressure, standing on cool pavement, and plenty of cold fomentations. Thrush and frog pressure cannot exist together, as the frog, if allowed to bear upon the ground, grows rapidly, when the disease effectively cures itself by growing out.

Sand-cracks, concave and convex soles, will all succumb to the same treatment; and as for navicular disease, the fact of its being unknown in countries where the frog is left as nature intends it to be, is, I should say, proof sufficient of what this disease is due to. It may, however, be as well to explain the cause of navicular disease, and how it best may be prevented or remedied.

If the reader will again refer to Plate I. (*Frontispiece*) he will observe an "O" marked beneath the navicular bone, which is the seat of this disease. The cause of the disease is from that portion of the weight which falls from the lower pastern bone upon the navicular bone, pressing upon the bursal sheath of the back sinew. If the frog took a bearing upon the ground—that, the natural cushion of the foot, would act as a support to the back sinew when the

part of the weight of the horse came upon it ; but in consequence of the absence of frog pressure, the strain or overtax upon the tendon at the ankle, where it makes its bend round the navicular bone, causes inflammation of a bursa, and the first stage of this disease has been reached. In the second stage the navicular bone, becoming affected by the neighbouring inflammation, rots, and when the disease has got thus far it is deemed to be incurable. In rare instances the rotting of the bone has stopped from frog pressure having been restored ; still the bone never becomes thoroughly sound. A little reflection on this important subject will show how very important frog pressure is, as, even when the horse is resting as he stands in the stall, some portion of his weight must fall from the lower pastern bone upon the navicular bone, which rests upon the back sinew, and which last should in turn receive support from the sensitive and insensitive parts of the frog underneath it. How much more then must this necessary support be needed when the animal is in motion, especially if at a fast gallop, or landing on hard ground after being leapt over a hedge. If the frog is there to receive the shock, the horse lands on his feet with all the ease and comfort that a cat does upon her's after a jump, but when the frog has been ruthlessly cut away there is nothing to break the fall, and, as is often the case, the animal is ruined by the jar having brought on irritation of the sheath which covers the back sinew, and inflammation sets in. If we, jumping from a height, light upon the ground with our heels first, instead of upon our toes, we feel shaken all over, and a horse

suffers the same sensation when he lands upon feet that have had their natural cushions removed. La Fosse describes this action as a "compression," fitly comparing the process of the lower pastern bone squeezing the nut bone (navicular bone) on the top of the tendon, to the action of "the hammer upon the anvil."

In examining, after death, the feet of horses that have been diseased in the manner I have described, it will be found generally that the laminæ (or elastic membranes that unite the coffin-bone to the hoof) have been destroyed, the form of the coffin-bone altered, and its size diminished (or the side cartilages changed to bone), and the whole of the interior part of the foot disarranged, or rather displaced. This shows the necessity of attending to horses' feet more than is commonly done, and grooms should be instructed to take the measure of their horses' feet at every shoeing, so that the slightest tendency to alteration would be observed in time. There is no difficulty in doing this; a piece of paper having only to be placed under each foot, and a pencil run round the outsides, when the sizes would be exactly given. These would only have to be cut out, and marked near fore or off hind, as the case might be, date of shoeing, with the horse's name on each paper, and put away for future use. A reference to these at any time would always show whether the feet were retaining their proper shape, or had got longer in form with narrower heels, when, if the latter case threatened, means could at once be taken to stay the contraction.

If there is one thing more than another to be ascribed

to bad shoeing, it certainly is what are termed cutting and overreaching. Not but what there are some horses predisposed to brush, or interfere by the malformation or position of their feet (the toe of a fore foot, for instance, instead of being in a line with the point of the shoulder inclining either inward or outward), but they are in number few in comparison with the thousands which are continually under treatment for cutting and clicking. As a rule horses oftener interfere behind than in front, but in the latter case, when it assumes the character of "*speedy cut*," the injury falling inside the leg, just below the knee, it becomes the more serious evil.

Speedy cut most commonly happens in horses with high action, and in others that carry their heads up, and in fretful impetuous animals generally. Farriers usually assume that the foot which interferes is too large, and regarding it as but a block of horn, rasp off as much of the crust as they think will permit it to pass the leg without touching, and if that does not answer, the foot is raised higher on one side than the other by thickening the shoe. The cause, however, is often from the shoe projecting, a clinch rising, or, more frequently, from the animal not being shod level and true.

In "speedy cut," the first thing to be ascertained, in order to effect a cure, is what part of the foot or shoe strikes the leg. When any doubt exists about this, it may easily be set at rest by wrapping a pipe-clayed bandage round the part struck, when a mark will be left on the part that strikes it, which must then be altered, but no cure can be sought for until the swell-

ing from the blow or blows has entirely disappeared. Generally a horse cuts with the inside fore part of the foot, and not with the inside heel, as is commonly supposed. However, it should be remembered that horses often cut merely from fatigue, or what is styled "leg weariness," and with such cases rest is only needed to cause a cure.

The usual method adopted to cure a horse from cutting is to rasp down the horn of the hoof that interferes, and apply a peculiarly formed shoe to the foot. This shoe, for a fore foot, is seated out on the foot surface, the inside half of the shoe being made considerably thicker than the outer half, so as to tilt the foot on one side; the inside edge of the shoe is also bevelled off so much as to give the shoe the appearance of passing right under the foot, and in consequence of the hoof being rasped down so thin that there is no room for a nail to hold, the shoe is only fastened to the toe and to the outside. I have in another place called attention to what this treatment leads to, so I will not again refer to what must appear so plain to even the most prejudiced mind. The hind shoe, "to prevent cutting," is made with a clip at the toe, and flat on the foot surface, being usually secured (like the other) by six or eight nails attached to the outside half of the foot, with one or two at the toe. No nails, from the same reason—rasping the crust so thin—can be driven inside, but of course that does not prevent the shoe being made so thick at this part as to tilt the foot outwards in the same manner that the fore shoe is fashioned. When it is found that both rasping

and tilting the foot outwards, has only tended to develope more fully the animal's power to injure itself, the thickening is applied to the outer edge of the shoe so as to tilt the foot inwards, and when this equally results in failure, the farrier gives it up, and declares a boot must be worn, the horse being incurable.

There is far more reason in the latter idea, namely, tilting inwards, than in the former one; for when a horse is at rest he supports his weight equally on both feet, but in motion, and having the inner heels and quarters raised above the outer ones, when one foot is elevated he must have a tendency to fall outwards, and as the only way for him to counteract that inclination would be to bring the moving foot nearer the supporting one, the two must come in contact, thus causing the very injury the form of the shoe is meant to prevent. But when the foot by the shape of the shoe is made to lean inwards, the tendency of the horse will be to fall in that direction, to counteract which he would naturally swing the moving foot outwards or further away from the supporting foot, and thus avoid striking. This last theory seems feasible enough until practically tested, when it is found that in nearly all cases the "cutting" continues as before, nor is it difficult to discover the reason. If, in any muscular effort, for instance, to lift a weight from off the ground, a man places himself in an unnatural position, the moment action ceases, to ease the strained muscles his body will at once bend itself in quite an opposite direction. In proof of this I need only refer to a particular class of tradesmen—tailors, who,

being obliged to sit while at work with their backs greatly bent, are particularly distinguishable from all other men, when walking, by the hollowness of their backs. They, as soon as they get released from a sitting posture, relieve the muscles of their backs by bending them as much as possible inwards; and by the same reason, if a horse's foot is raised on one side it either causes him, if it tilts outwards, to move it in the opposite direction, or if tilted inwards he is unable to lift his feet otherwise than by a circular motion in the same direction—either way being alike disastrous.

To remedy or to cure a horse of brushing or overreaching he must in the first place be shod perfectly level. We can never expect to gather grapes from thistles, neither need we ever anticipate curing a horse of cutting by the very means we should adopt if we were striving to make him strike the fetlock joint of one leg with the foot of the other. We might as well expect to cure one broken leg by breaking another, as to cure interfering with the shoes our blacksmiths use for that purpose. Next to shoeing level endeavour to alter the horse's style of going; for instance, if his heels are high, lower them as much as possible; if the toes of the foot are long, shorten them well, and I will guarantee that any horse that interfered before being thus treated will not do so afterwards, provided he is not deformed about the knees or feet.

Overreaching, or clicking, is more uncomfortable for the rider to hear than dangerous to the animal itself. To cure this the farrier fastens on a shoe that does not

reach the toe of the hind foot by half or three-quarters of an inch, so that, although the forging may continue as bad as ever, yet by the toe thus hanging over the shoe the clicking sound is only deadened, not removed. Now we have only to consider what causes "clicking," to find the remedy. A horse clicks because his hind feet overtakes his fore feet, that is, the hind feet in their stride either reach too far, or the stride of the fore feet is not great enough to get clear from the hind ones. If such a thing was ever required as to shorten a horse's stride, all that would have to be done would simply be to shorten the toes, and allow the heels to grow high, and soon a very perceptible change in his length of pace would be observable. In my experience I have mostly found horses with high fore heels to be clickers, and have also found that lowering the heels of the fore feet as much as those would permit of, together with putting lighter shoes on in front than behind, invariably effected a cure.

Laminites or foundered feet is, in my opinion, traceable likewise to the pernicious habit of paring away the sole and mutilating the frog. All authorities agree as to the symptoms of the disease and the effects they afterwards produce in the fore feet, while they equally agree that it is caused by violent exercise. A horse attacked with this disorder pushes forward his hind feet almost under his shoulders, so as to ease the fore feet as much as possible from the weight of that part of the body above them. The hoofs, at the same time, are so hot that if water is thrown over them they dry

instantly, while the intense pain the animal suffers is evident by his quick breathing, his heaving flanks, and groans at the least attempt to move him.

Now we have only to suppose a horse in wide webbed shoes to be driven rapidly over a hard road, to recognise the fact that the blow and friction each time the feet come to the ground would produce a certain amount of heat in the iron shoe, which would increase according to the length of the journey and the rate the horse was being driven. If, in addition to being shod with wide webbed shoes, we also suppose the horse's feet to have been mutilated in the usual manner, we—iron being such a good conductor of heat—can easily imagine how hot and inflamed those feet must become. Between this state of the feet and that of laminites or founder, the difference is but a slight one. But if a horse was shod with narrow webbed shoes, and had his feet left in their natural state, except the necessary lowering of the crust previous to shoeing, I feel confident that however fast he was driven over any kind of road, his feet would not only keep comparatively cool, but he would finish the journey almost in as good order as when he started, and as free from founder as he would be from that which causes it. It is unnecessary for me to go further into the matter of diseases of the feet, having, I believe, said sufficient to direct attention to what I have perhaps too strongly urged. If I have done so, I can only state in excuse that, in the matter of suffering horses, I feel strongly, and what I have written does not in most instances fully express those feelings; I can, however, honestly add, that

beyond the desire of benefiting these noble creatures, I have no wish for my feelings or my opinions to be known, far less that they should be detrimental to any person or persons whatever.

CHAPTER VIII.

SOME SUGGESTIONS HOW A SCIENTIFIC KNOWLEDGE OF THE HORSE'S FOOT COULD BEST BE ACQUIRED BY FARRIERS.

That farriers should possess an intimate acquaintance with the anatomy of the horse's foot, is a matter of the present time that will admit of no argument to the contrary, as it might with equal truth be advanced that knowledge of an engine was not required by an engine-driver, of a watch by a watchmaker, or that navigation was too useless a study for the captain of a ship ever to trouble his head about.

Hitherto tradition and routine have been permitted to guide farriers in their wondrous ways of horse-shoeing; consequently, it is a question whether, in following the customs and manners of their forefathers, they are more to be blamed than the general public—often too prone with abuses to adopt Lord Melbourne's plan, "let them alone"—for not insisting upon a change. There has been certainly from time to time prizes offered at agricultural shows for the best description of horse-shoe, but as that was only a question of neat workmanship being put into the neatest glass case, neither horses nor the public have benefited much from these exhibitions.

I remember at the agricultural show held at Manchester in 1869, that although three prizes were offered for different kinds of horse shoes, there were only the same number of competitors, who, of course, got a prize each; these being awarded more, apparently, according to the get-up of the shoe, than to any genuine value in their particular shape or other excellence. If prizes are given—and I think they ought to be—at agricultural meetings, they should be awarded to the horse-shoers who could best give a verbal description of how to fit out and put on a shoe, in preference to men whose sole merit is being able to use the turning hammer deftly. Some time ago the foreman at the Glasgow Veterinary College made a remarkable number of horse shoes in an hour—some dozens if I remember rightly—and for having performed this feat he is looked upon as being the best farrier in the three kingdoms. I should, however, be more inclined to award that honour to a man who was able to answer questions correctly relative to the formation and functions of the different parts of a horse's foot, and afterwards practically carry out what he had explained verbally, than to a man who could make seventy dozen shoes in an hour. Perhaps the foreman at Glasgow is even more clever at describing how shoes should be put on than at making them; if this is the case, it is a pity that his being so was not mentioned as well. Agricultural show prizes, discriminately bestowed, would doubtless do much, but there is a specific superior yet to them.

This remedy—education—will at once appeal to everyone as the solution of the difficulty, but we all

know that a horse can be taken to the water by one man, while twenty men could not make him drink, and in the instruction of farriers a similar obstacle might arise—they may refuse to drink at the fountain of knowledge, preferring, of course, what they have been most accustomed to—a draught from the waters of ignorance. Now, as we never find a generally intelligent man the worse workman for his intelligence, but always the reverse, we know until farriers can be made to see that it is their interest to become educated to a certain degree, we shall never be able to get them to acquire knowledge or to become more humane than they are at present. In this matter, therefore, it is the public and the veterinary surgeons who must take the initiative, the former by refusing—after a certain time has elapsed—to employ any farriers but those who can produce a certificate of competency from the veterinary college nearest to them, and the latter by throwing open schools of instruction for shoeing-smiths in every town, delivering in them annual courses of lectures upon the horse, his feet, and the diseases belonging to them, and how they should be shod, in plain every-day language, that all might understand.

Then farriers, finding their advantage was to study, would do so ; and then, also, they could be judged and classified by the standard of educational abilities and their knowledge of the animal given to their care, instead of as at present, when the test is merely workmanship. We give now the highest wages to the man who can turn out the neatest-looking shoe in the least time, while

the more particular parts, the preparation of the foot for the shoe, and the subsequent operation of attaching the shoe to the foot, is recognised as only an ordinary matter, which any one can do, and is paid for accordingly. Here a piece of manual dexterity receives the principal reward; but, as I have observed already, a horse will suffer less by having an ill-made shoe attached to his foot on sound common sense principles, than he would do from a shoe, however mathematically and correctly finished, that was fastened on without a due regard to the physiological formation of his foot.

If my suggestion of classes of an evening for farriers was acted upon, we would soon find a superior staff of workmen spring into existence; a class, I will venture to say, that would not allow trades' unions to lead them by the nose. We should then have men able to think and act for themselves, for knowledge ennobles the mind as well as cultivates the understanding. And confident am I, that if farriers can only be induced to make the foot of the horse their study, they will find in it so much that is entertaining and edifying, that what was first taken to as a toil, would soon become a work of pleasure, I might say a delight. How could it be otherwise? for every hour they studied would they not learn something new and grand, of which before they had not the slightest conception? Their work, which hitherto had been only regarded as the means of earning a bare living, would now be elevated to an art, as well as a means of subsistence; in short, a profession akin to that of the engineer and the physician.

Let us try to fancy a farrier of the prevailing type existing among us, attending evening classes, with the wish for improvement, without which all would be futile. Imagine him learning how those hard horn pillars grew downwards continuously from day to day, the old materials being pushed off by the new, and having his attention drawn to the beautiful junction of the hair to the horn at the pastern, by a gradual and imperceptible change from skin to a substance resembling gutta-percha, and as the growth advanced from the coronary band to the crust, how, this continuing, supported the great weight of the animal, with a firmness and precision all as astonishing to the learner as it would be gratifying. Pursuing his studies, he would find, hid up inside of these horn pillars, a mass composed of bones, of blood-vessels, of cartilages, of muscles and of sinews, all working in their natural state, and each performing their distinct parts so well, and in such harmony, that, when allowed by such as him, one portion never interfered with another. He would find, when looking at the fore leg of a horse, that it was something of far greater importance than ever his wildest flights of fancy supposed it to be. He would remember how, at one time, he had looked at it without awe, because he had regarded it without understanding; but now, looking at it with other eyes, he would see in it nothing but what was a cause for his admiration and wonder. He would perceive how the splint bones were joined to the cannon or shank bone, and how that last formed, with the upper pastern bone, the knee joint; how the two pastern bones joined at the

fetlock, and how in turn the lower pastern bone rested in a socket which was made for it by the coffin and navicular bones, both inside of the foot. Going back to the top of the fore leg and in front of it he would observe that the front sinew (extensor tendon) passed down the leg until it entered the foot and buried itself in front of the coffin bone. At the back of the leg he would notice a number of sinews and ligaments known by different names, the one nearest the splint bone being termed the *superior sesamoidal ligament*, which, dividing one part branching off at the knee, passes over the pastern bones, and enters the foot along with the *extensor pedis tendon;* the other part inserting itself into the *sesamoid* bones. The flexor tendons (perforatus and perforans) and metacarpal ligament he would observe behind the *sesamoidal*, in the inverse order to what I have them here, and these are the passive agents or ropes by which the leg is raised upwards whenever the horse is in motion. All of them are joined together before the continuation, as it is termed, of the *flexor perforans* inserts itself into the lower side of the *os pedis.* In the foot the farrier-student would find a still greater field of instruction, the shapes of the coffin and navicular bones affording in themselves subject enough for months' thoughtful attention. The former he would find in form something like the hoof that covered it, being semicircular in shape, wide and thin at the base, but getting stronger and thicker towards its upper part, which leaves its under surface arched and concave, a wonderful provision of nature to prevent the body from receiving too great or too sudden a

shock in leaping or moving at speed. Before, when unacquainted with the anatomy of the horse's foot, he would naturally have supposed that the internal parts of the hoof were simply enclosed by the horn casing, which, by its hardness, served to protect them from the blows and pressure to which they would otherwise be constantly exposed, but now how different would his thoughts be as every portion was placed plainly to his view, and the uses and qualities of each fully interpreted in turn! He would have explained to him how the parts of the internal foot are so nicely adapted to the cavity of the hoof, that while they completely fill it, there is not the slightest inconvenience from pressure, until the treatment he had formerly practised was applied; when, what with the mutilation he had of the frog, sole, and bars, and fitting on a heavy shoe red hot, caused in time the hoof to contract and the cavity to diminish, when the nerves and blood-vessels being compressed, and the circulation of the blood impeded, inflammation and lameness as a consequence ensued.

Coming to the internal foot, the bottom of it, formed by the sensitive frog, sole, and bars, would be exposed to his view, from which he would see how the convexities of the first were so nicely adapted into the concavities of the horny frog. The sensitive sole and bars he would in like manner recognise, as also their special functions in providing horn for their external parts. He would perceive that it was for this purpose the numerous blood-vessels were supplied, as likewise enabled to account now for thrush, and the rottenness of frog which accom-

panies that disease. He would now understand how, when the sensitive frog was compressed and inflamed by a contraction of the heels, it became incapable of performing its principal function—providing the horn—because the blood intended for that purpose was expending itself in forming that offensive matter discharged in thrushes. Next, he would be studying the connection between the horny wall and the more sensitive parts, the sole and frog, learning why the latter consisted of a different kind of horn from that of which the crust is formed, being scaly at one part, and soft but elastic at another; its very concavity enabling the horse to tread more firmly on the ground, while the convexity of the tough elastic frog prevents the foot from slipping. Between the two parts, the sensitive and the insensitive, he would discover two cartilages or elastic bodies, covered in a great measure by the heels or quarters of the crust, but belonging to the latter, which would tend to keep the heels open, and not only that, for when the frog comes in contact with the ground and receives the pressure of the horse's weight, the sensitive frog is forced upwards and rendered wider, at the same time the cartilages are forced upward and outward, thereby expanding the heels and quarters, as well as preventing concussion.

And when he had thus observed how beautiful each part of the foot was constructed, and how impossible it could be for the most skilful and humane of workmen to make an iron shoe that could be worn for four weeks comfortably, even if the foot was left as near its natural

shape as could be done, he would at once make it his sole aim and study to render shoeing horses as little of a hardship, far less torture, to those animals as he could ever possibly do.

Before concluding this chapter I may be permitted to speak of an evil existing among shoeing-smiths, to which, I fear, much of the ignorance and brutality they are accused of might be traced—I refer to drink. To the inordinate use of strong liquors farriers, from time almost immemorial, have been addicted; and putting entirely aside all the misery and misfortune drink brings upon themselves, I will only draw attention to the injuries daily inflicted by men under the influence of liquor upon the poor dumb animals turned over to their care and protection. Here, in London, wherever there is a farrier's shop, within fifty yards, often next door, will be found a public-house; and as it is the custom for all the men to drink together, a score is run up hourly, which it takes a good portion of their collective pay to settle weekly. Horses, through the drinking, are often struck with hammers and pincers, and cruelly kicked, because their terror makes them endeavour to escape further torture. If they continue to struggle against the ill-usage, they are beaten with twitch sticks preparatory to the twitches being put on their lips and ears, and screwed up often so tight that the skin either gives way or the blood springs out; and I can confidently assert that while I have seldom, if ever, seen a horse ill-treated by a man who was perfectly sober, I never saw one in drink use a horse quietly. Having had to do with horses

since 1843 in all parts of the world, my experience has been both an extensive and varied one.

At the same time, I am far from being one who thinks that drinking is the fruitful source of every crime and cruelty committed under the sun, for I believe that there are many people who, if restricted as to the partaking of stimulants, would suffer in health from the restriction; but from my long and intimate intercourse with farriers, I feel confident that if *they* could all be persuaded to turn tee-totallers to-morrow, the gain to the public in general, and to the men themselves, and to the horses in particular, would be incalculable.

There have been of late years many public companies started into existence, some of which have met with misfortune and others with success, but I am certain none of the latter ever had such a chance of succeeding as an English Shoeing Company would have, if it opened shops throughout the kingdom to shoe horses on humane and common sense principles, and only employed farriers who were abstainers from drink.

Perhaps temperance should be tried upon them before education; anyway, the two would go well hand-in-hand, when the satisfactory result to be anticipated could not for a moment remain in doubt. A shoeing company, however, that only employed men who were abstainers, and who could induce their men as well to attend evening lectures upon the horse's-foot, given by veterinary surgeons, would, I am confident, have a great and deserved success.

CHAPTER IX.

ABOUT HORSE SHOES—OLD AND NEW.

Although I have headed this chapter with the word "Old" in connection with horse shoes, it is not my intention to rake up old iron from remote ages to illustrate this part of my essay, being assured in my own mind that I can find enough, within the last two centuries, to answer my purpose.

As a rule our horse-shoers are content with the old system of shoeing, as well as the old form of shoe, so if a shoe is simply termed "new," that would be enough in many instances to ensure, at their hands, its condemnation. Men of this stamp are difficult to convince; they think they can stand, as it were, with their backs against the door of the world, in order to prevent novelties which might interfere with their opinions from coming in. But the world's walls are wonderful ones, and its side-doors numerous, so while these opposers of progress manage to keep the main gate closed, the truth contrives to scale the walls or slide in by side-doors the same as if no obstacle existed. Now for a description of some old shoes.

Sir William Hope, in his *Perfect Farrier*, published in 1717, is in raptures with the Panton shoe, which

were shoes made with straight spunges, and thicker in the inside edge than the outer, and so formed that the sloping or thick parts of the spunges may enter within the corns of the frog. This shoe was made flat at the toe, where it was pierced for the nails, and considered to be *the* remedy for pumice, or flat-footed horses. A modification of it, termed the half-Panton shoe, was also in much request at the time, but neither of them answered the purpose for which they were intended, and now they are never heard of.

We owe to M. La Fosse much for his treatise on shoeing, as he, striking at the root of the disease, advocated that "neither the sole nor frog should be pared at all, for neither will ever become too large for its growth; but in proportion as each grows it will dry, scale, and fall off in flakes; that the edge of the hoof, if thought too long, should be taken down as usual, and then a shoe, in form of a half-moon, set on, reaching the middle of the hoof; the heels might be thinned, and the shoes made a little longer for such horses as have weak hoofs." The "lunette shoe," as it was termed, met with considerable success, for it was found to suit all but very weak heeled horses. Its principal fault was in its number of nail-holes—eight—which, being so close together, broke away the crust, and in their position at the toe, where the leverage is greatest, all combined with the wear at the part, was against their ultimate success. The principle of shoeing was however excellent, and M. La Fosse commands our gratitude for having introduced his shoe and system to the notice of the public.

The seated shoe was introduced many years ago into this country by Mr. Osmer, as being much superior in principle to the shoe then in use, but, like everything else likely to be an improvement in farriery, it made but little way. This shoe is of an equal thickness, quite flat, and parallel from the toe to the heel, deviating in width according to the necessity of the case, and similar to the ordinary shoe with regard to the fullering, nailing, etc. The foot surface of the shoe differs in having a narrow plain rim, about the width of the crust, all round the outward edge of the shoe, except at the heel, which for about an inch is a flat surface, the whole width, and the remaining part of the shoe being bevelled out from the inward edge of the seating. The only advantage this shoe had over others was, that the crust rested on a flat surface instead of on an inclined plane.

We next come to the shoe recommended by Mr. Coleman, which places the level of the shoe upon the ground-surface, in order to secure to the horse a better foot-hold. Its most remarkable peculiarity is in its being three times thicker at the toe than at the heels, which, if meant to induce frog pressure, had an advantage, I believe, in that respect, but in no other. Such a shoe, however, would not answer for going uphill, as it would cause an over-strain upon the back sinews, while the tendency to trip would be much increased in a horse predisposed that way. The merits of the shoe are its narrowness of web, and the bevel on the ground-surface, which must afford greater security to the animal when

travelling over the convex-shaped stones with which our streets are paved.

The elasticity or expansive power in the foot has given rise to much discussion from time to time, and we have had shoes specially adapted in order to give the hoof full play, should it have any inclination to open out between the periods of shoeing. There has always been a difference of opinion among authorities whether the horse's foot contracts or expands, or does neither the one nor the other, when it comes to, or leaves, the ground. For my part, I am inclined to believe that it is claw-like, and tries to grasp the ground each time it is put down; that when it reaches the ground the grasp is relaxed, when the weight of the horse falling upon the frog (if it is there) causes the whole foot to open towards the heels, leaving the ground again with something like a bound, and thus the heels have a small degree of contraction and expansion at every tread which the horse makes on the ground.

But whether the foot expands or contracts, or does neither, jointed shoes have always proved to be failures, and the cause is not difficult to determine. Mr. Bracey Clarke invented a shoe with a joint at the toe, which he called a "*great discovery*" in his day, adding that it would form "*a basis for the repose of the profession.*" He claimed for it the power to relieve the feet from the restraint of the shoe and nails, by permitting the natural expansion of the hoof, and averting thus all the evils of the common system of shoeing. The cause of failure was simple enough, and had the inventor taken the trouble to

fix his invention upon the model of a hoof that allowed of expansion, he would soon have discovered that the nails held the shoe as securely as if there had been no joint there, and that all expansion in the hoof was by them prevented. If the nails could have about a quarter of an inch play either way, then a jointed shoe would have some chance; as it is, there is none for it whatever.

A Mr. Rotche took out a patent in 1816 for another shoe, similar in principle to Mr. Clarke's. This shoe, consisting of three or more pieces, attached to leather by rivets, was found utterly useless for the purpose of allowing the foot to expand. Since then we have had Harris's (of Shiffnal Salop) expanding shoe, which was patented in 1841,—and Lanty's shoe, to allow of expansion, prevent concussion, wearing out of nails, and to prevent slipping—patented 1865. All of these attempted step-mothers of nature have been failures, proving that no amount of art can ever replace the proper preventer of contraction, concussion, and slipping —viz. the frog.

From time to time several screw shoes have appeared, each in turn affecting to be *the* cure for contraction, but in every case the boasted efficacy of the contrivance turned out to be quite imaginary. Sir John Rogers introduced a shoe with a claw to it, intended to resist any closing at the heels, but, like the others, it was found not to answer. The screw shoe was made with a joint at the toe, having the screw at the heels passing across the foot from side to side. The foot was kept in water to soften the horn, and every day the screw was slightly

turned by a key, the hoof apparently opening wider at the heels by the interior lengthening action of the screw. But it was soon found that no proper expansion took place, it being either the nails that gave, or the crust that split. So ended the theory of the screw shoes, which could never have been looked into properly, as they would not have stood the test of common sense investigation an hour. We have only to imagine that if the nails did not give, nor the crust split, while the shoe was forced wider apart, this result must follow—viz. the wall of the foot would be torn away from the sole, and the laminæ at the heels; a much more serious consequence than the contraction could ever have produced.

Of shoes to prevent slipping there have been several patented, but I will only refer to three—viz. Woodin's, patented in 1845, Palmer's, patented in 1867, and Gray's, patented in 1869. Woodin's is a double-bevelled, widish-webbed shoe, with teeth or notches on the inside rim, as a preventative to slipping, the nail-holes being outside of these in a kind of fullered groove. Being made of cast iron it never could have answered, even had its construction been faultless, which it was not by a long way. Palmer's fore shoes are simply a copy of Woodin's, but the hind shoes differ in there being a blade at the quarters instead of teeth; in fact the hind shoes so much resemble skates that one cannot help fancying, when he sees them, that they are meant to assist a horse to slip, instead of being a prevention against slipping, as they pretend to be. These are made in a tool, and cost six shillings a set with putting on. Gray's are steel shoes, made by

machinery, and are simply ribbed and grooved bars, from an inch and a quarter to an inch and three-quarters in width, turned round in the shape of horse shoes. Their price, which was from two shillings and sixpence to four shillings a set would be a sufficient obstacle against them ever coming into general use, irrespective of their liability to fracture their width of web, and the peculiar advantage their form gives for slipping sideways, which no other shoe I ever saw possessed to a quarter of the extent that those do. After they had been worn smooth at the toe, I am sure that no horse could keep his feet, shod with Gray's shoes for forty yards in London streets any day after a slight shower, as the grooves run parallel (except at the toes), with the paving-stones over which the animal would have to travel.

Colonel Fitzwygram, of the 15th Hussars, recommends a shoe turned up at the toe for the fore feet, as does likewise Mr. Haycock of Manchester, for roadsters and harness horses. That the arguments brought forward by Colonel Fitzwygram in favour of this shoe deserve more than a passing notice I am bound to admit, and I will endeavour to fulfil the responsibility. Starting from the point that horses wear their shoes most at the toes, and that they invariably go better when the toe has been worn down a little, the Colonel proceeds to draw attention to the fact that the coffin-bone of the horse's foot has likewise this rounded form at the toe, and putting all these facts together, infers that the shoe should be made to follow this design. At first sight this all appears both feasible and logical, but when we begin to reflect

that surely nature could never intend one-fourth of a horse's fore foot to turn upwards from the ground, at the very part she has supplied most bountifully with horn, as if a more than usual bearing, instead of a less, was to take place here, we begin to perceive the weakness of the Colonel's position. And when we likewise remember that the fore feet of a foal at birth show no more sign of a turn up at the toe than at the hind feet, that horses so shod could keep but an indifferent hold of the ground, and that when galloping they would be rocking in front until there was a danger of them falling, we then are sensible that this theory will not stand the test of practice.

Mr. Fleming, in his recent work on *Horse Shoes and Horse Shoeing*, recommends that the old common seated shoe, introduced years ago into this country by Mr. Osmer, requires simply to be turned over—the ground surface becoming the foot surface, and *vice versa*, to form the most perfect shoe that he knows of. Although it savours a little too much of legerdemain, this turning over of the shoe that Mr. F. advocates, something that reminds one too forcibly of Herr Dobbler's style, as if he was addressing us with "Here gentlemen, in my hand you will perceive a common horse-shoe, an old affair, so very old that our grandfathers could not remember its introduction if they were alive, and were I to venture to say how many thousand horses this sort of shoe has ruined, you would not only be *amazed*, you would be *horror-stricken;* look well at this shoe, *presto*, I have but turned it over gentlemen, when it has become the most perfect

horse shoe in existence." Yet I should certainly credit Mr. Fleming with the discovery, simple as it is, had not Professor Coleman, about the end of last century, recommended a similar change to be made in the very same shoe. In his *Observations on the Foot of the Horse*, and the *Principles and Practice of Shoeing*. Mr. Coleman, at page 88, thus writes, "The best form for the external surface of the shoe is a regular concavity, *that is the common shoe reversed*. This shoe leaves the hoof of the same figure when shod as before its application. And it is evident that a concavity has more points of contact with pavement and other convex bodies than a flat or convex surface, and that the horse is consequently more secure on his legs. A shoe that is flat externally may preserve the hoof equally well in health; but this form is not so well calculated to prevent the horse from slipping, as a concavity."

Mr. Fleming's words (after describing the objects to be gained by shoeing) are, "The simplest method of doing this is merely changing the bevel on the foot surface of the ordinary shoe to its ground surface, making what is now concave plain, and the flat slippery ground surface concave. The effect is almost magical."—(*Horse Shoes and Horse-Shoeing*, p. 664.) Now, as Mr. F. quotes largely from Mr. Coleman's "book," it would be superfluous to imagine that he had not read the extract, from his work that I have given, yet, so far from acknowledging that he derived the idea of the reversed shoe from Mr. C.'s book, Mr. Fleming rather speaks slightingly of both the author and his production. Here is what appears in *Horse Shoes and Horse-*

Shoeing, p. 518, and headed "Coleman's Opinions." "Every allowance must be made in criticising many of Coleman's notions with regard to shoeing. Though a most promising surgeon before joining the Veterinary College, his opportunities for studying comparative pathology, and especially the subject under consideration, must have been rare. Medical men, it must be remembered, unless they study these matters as carefully as they have done those connected with their own profession, are apt to commit very grave mistakes, their special knowledge being at times more liable to mislead than to guide them." And again, he continues, "Coleman repeats the statement as to the evil influences of paring and bad shoeing; and, owing to his exaggerated notions of the elasticity and expansive properties of the foot, adopted almost entirely La Fosse's ideas as to the manner in which it ought to be shod." Certainly these are very cool remarks of Mr. Fleming's; after having *adopted* the credit of introducing a form of shoe that Mr. Coleman had recommended so long ago, would it not have shown better judgment in Mr. Fleming not to have noticed Mr. Coleman's book at all?

At the "Workmen's International Exhibition," held two years ago in the Agricultural Hall, London, there were several exhibitors of horse shoes, one or two of which are deserving of notice. Mr. Pringle of London exhibited what he terms* "a cone-jointed horse shoe,"

* Mr. Pringle's shoes were also in the International Exhibition of 1871, his and the Goodenough Horse Shoe being the only ones that were shown there.

which, like others of its class, has no merit beyond some originality in design. Mr. Pringle also shows "An improved clog for roughing," which I fear is too cumbrous and costly ever to receive much patronage. It is meant to be attached to the shoe in frosty weather, and is a double section-plate with clips, which fasten on to the shoe at the toe and heels. It opens or closes by the action of a screw in the centre, and has four claws (moveable) to prevent slipping on the ice. This clog might answer the purpose intended, but is open to objection on account of its extra weight, and the chances of one or more claws breaking or coming out, while the frog in its natural state is far before any artificial preventative there is or ever can be made against slipping. Mr. Coles, an optician of Birmingham exhibited a shoe and model. This is a method of attaching the shoe without nailing, by taking advantage of the slope of the hoof it fits all round the crust in the same manner as a clip. It is in two parts, which are united at the heels by a double joint that fixes under the frog. the whole fastening in front like a bracelet, only that it is a screw which secures it instead of a clasp. This, however, is only the frame of the shoe, which also, in two parts, is fastened on to the lower plate by screws, and so those can be replaced when necessary. Some considerable ingenuity is here shown, but as the frog has to be cut in order to fix the shoe on, while it would have to fit very tight, I am afraid a shoe of this description would be the cause of more contraction than any other now in use. Certainly there would be the

advantages of no nails nor rasping, while it could be taken off at night; but the expense, the necessity to cut the frog, together with its liability to break, will prevent it from ever becoming anything more than a curiosity.

The india-rubber frog, which has been patented by an Edinburgh Company, answers as a preventative against slipping better than any other thing of the kind I have seen, but as it is at best but a substitute for the natural frog against slipping, and can never act as an expander of the foot, it can only be recognised as a make-shift. Like leather soles, it is also of a heating nature, and therefore likely to prove injurious. The frog itself, answering all purposes as an impediment to slipping, is far preferable to any artificial inventions meant to take its place.

I now come to narrow webbed shoes, the only shoes in my opinion worthy of being adopted as the general shoe for every description of horse. I hold that there is no more mistaken idea than that which permits of a particular formation of shoe for every class of horses, and for every degree in each class. Not only—does this idea say—shall cart-horses have different shaped shoes from van-horses, carriage-horses from cab-horses, hunters from hacks, and ponies from all the other six, but that each lot should be again sub-divided into low heels and high heels, convex and concave shaped soles, feet disposed and indisposed to contraction, besides the various kinds of shoes to prevent cutting and forging.

Now if we refer to the writings of every author on the subject of horse-shoeing, from Blundevill, who lived

in the reign of Queen Elizabeth, down to the most recent authority of our own time, the number who recommend a particular shoe for every kind of horse might be easily reckoned on the fingers of one hand. Lord Pembroke, in his treatise, writes, "From the race-horse to the cart-horse the same description of shoes and system of shoeing should be observed; the size, thickness, and weight of them only should differ, the shoe of a race-horse must of course be lighter than that of a saddle-horse, that of a saddle-horse lighter than that of a coach-horse, and this last more so than a cart-horse." I might give other authorities, but believing that all reasonable people will, upon consideration, perceive that as all horses have hoofs of a strength proportionate to their bodies, they only need shoes the strength and thickness of which is in a corresponding ratio; and therefore the same description of shoe, if it benefits hacks, hunters, or ponies, will prove equally beneficial to draught-horses of every kind.

Lord Pembroke was a great advocate for narrow-webbed shoes; broad-webbed shoes, he said, were most "absurd things," adding, "Nothing more is wanted than iron enough to protect the outward crust of the foot, and to prevent its breaking." His idea was a narrow iron bar, bent round, having the same thickness throughout; it is certainly far preferable to the wide webbed shoe, which overloads the foot and gives no firm hold upon the ground. Professor Coleman's shoe might be styled a narrow webbed shoe, as also one or two others, which need not be described, being now out of date.

The two shoes and systems of shoeing which have most occupied the public mind are the "Charlier" and the "Goodenough," and I cannot conclude this chapter better than by endeavouring to analyse the merits and faults in each of these. The first is known as the pre-planter or French shoe—its inventor being a Frenchman; but before entering into a description of this method of shoeing, I will give the grounds upon which M. Charlier bases his theory.

Accepting as a fact that the unnatural work horses are subjected to upon artificial roads is too much for the hoof to stand, while the present system of putting on heavy wide shoes after removing the constantly renewing horn from the sole is a remedy worse for the foot than any injury the hardest road could inflict—M. Charlier thought that a thin light piece of iron let in round the lower part of the crust, similar to a ferrule on a walking-stick, would not only prevent the horn of the hoof from breaking, but would prove a sufficient obstacle against the wear of the hard roads. He therefore decided upon the following plan of shoeing, from which, and the accompaning illustrations, the reader will doubtless be able to understand what the merits of the contrivance are.

Using an instrument something like a square gouge (Fig. 8, A), with a guide to prevent its cutting beyond the required depth (B), the farrier scoops a rectangular groove from the outer circle of the horse's foot (C D and E). Into this groove is fitted an iron band, measuring rather more than the thickness of an ordinary horse-shoe, with less than half its width (Fig. 9, F and G);

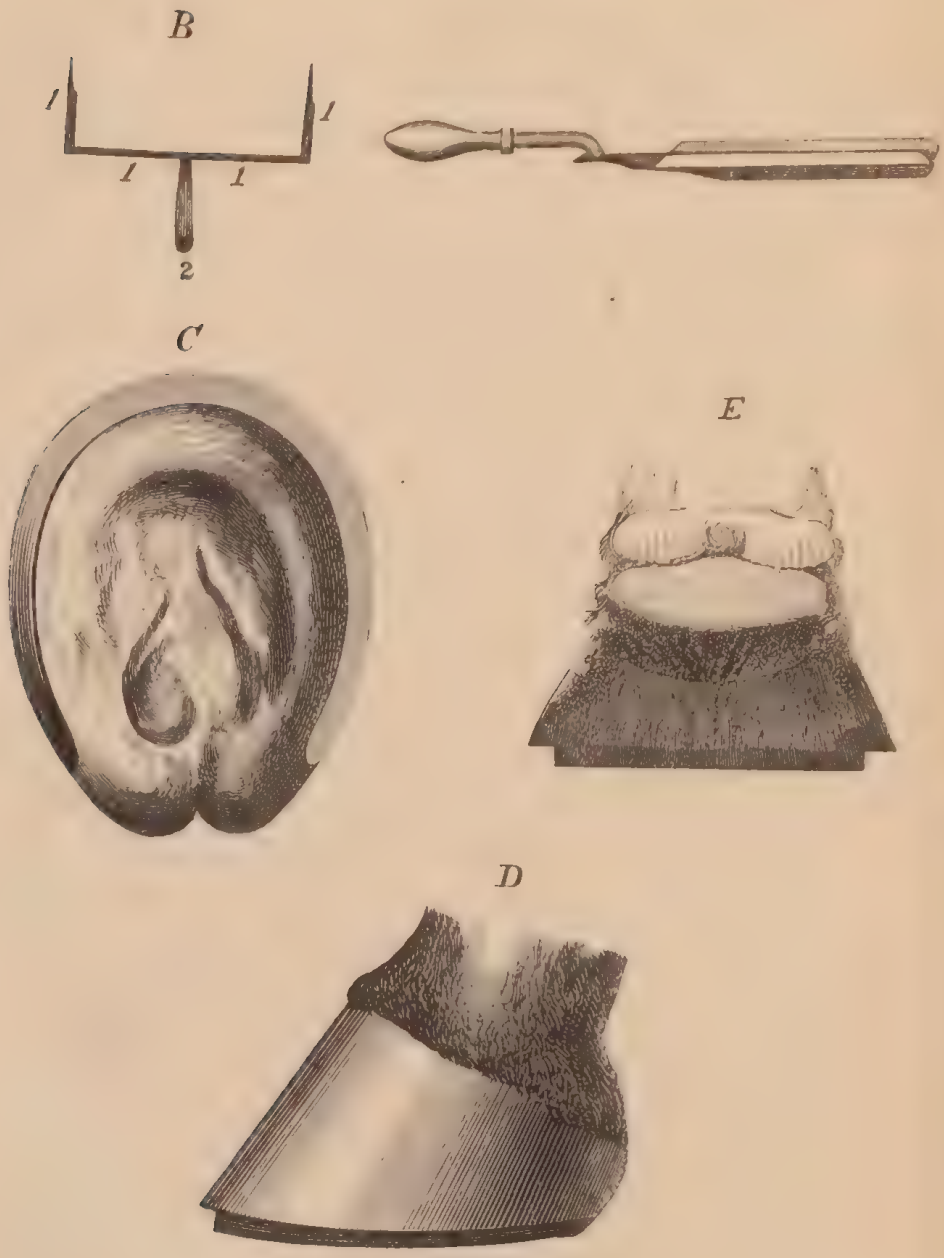

Fig 8.

TO ILLUSTRATE THE CHARLIER SHOE AND SYSTEM.

A.—Square gouge for cutting groove in hoof.
B.—Guide to prevent the gouge cutting too deep.
C.—Bottom view of foot prepared for shoeing.
D.—Side view of foot prepared for shoeing.
E.—Section of foot prepared for shoeing.

this is secured by five or seven nails. The shoe being thus sunk into the crust, the sole of the foot, which is never pared, and the frog, are brought on the ground. The shock of the constant concussion of the iron shoe on the hard road is thrown into the wall of the foot, and not into the softer parts of the foot, which are protected by the tough and elastic horn of the sole ; the frog being also brought on the ground, allows the animal to feel, and as it were to grasp, the earth in slippery places. The shoe being thin and narrow, is said to have a certain amount of elasticity about it, and, after a few days' use, adapts itself to the natural shape of the foot, expanding with its movement, and developing the frog, bringing the whole foot into action.

Another advantage claimed by the inventor is, having the holes into which the nails are driven made oval instead of square, by which a rectangular nail, when driven in, takes its shape, and so acquires a firmness of hold that it would not otherwise have. I expect, however, that the true cause of this departure from the form of the old nail-holes is, that the extreme narrowness of the web of the shoe will not permit the holes to be punched in the usual manner, and therefore they are obliged to be drilled through.

That M. Charlier has shown a considerable deal of originality in the conception and in carrying out the design of his shoe, no one will, I think, attempt to deny. To me, his idea of a ferrule kind of horse shoe seems to be a particularly happy one. But this, which should be the strongest point—being the basis—in the Charlier

shoe, is unfortunately the weakest. Could the shoe have been made to encircle the hoof, in the same manner as the ferrule girds the stick, then its principal fault would never have existed; but as the thin iron band only reaches

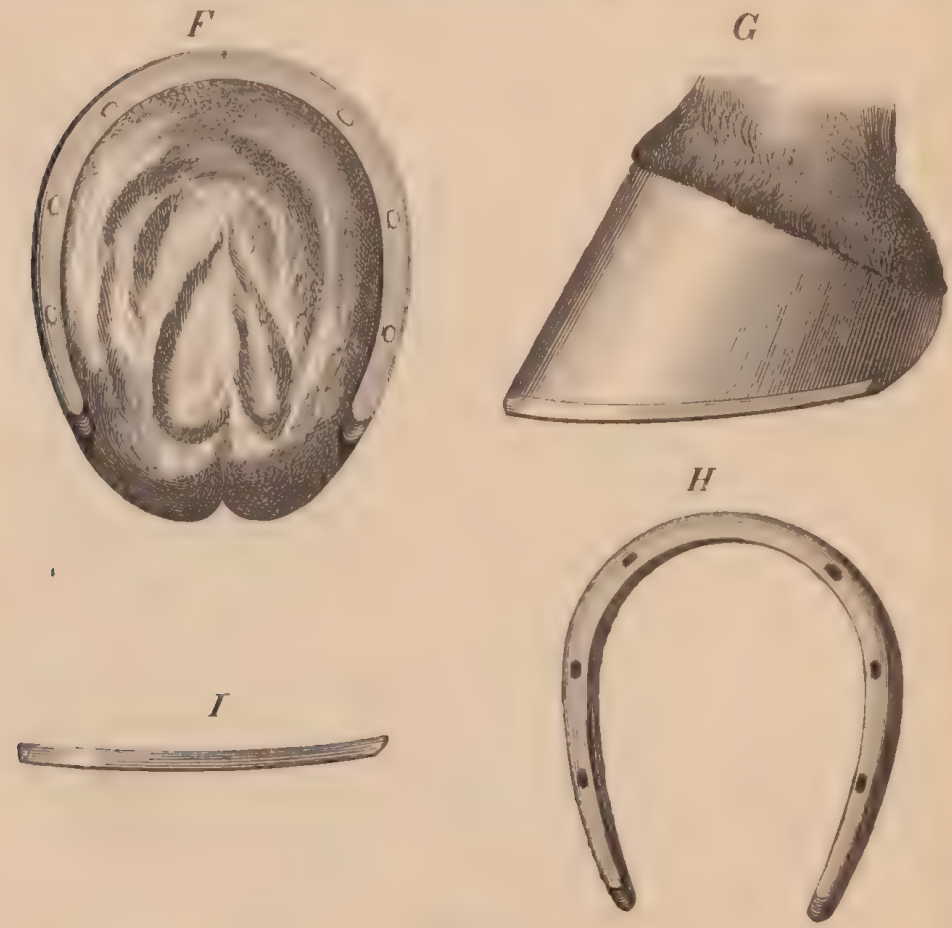

Fig. 9.

TO ILLUSTRATE THE CHARLIER SHOE AND SYSTEM.

F.—Bottom view of foot shod with the Charlier Shoe.
G.—Side view of foot shod with the Charlier Shoe.
H.—The Charlier Shoe.
I.—Iron band it is made from.

the heels, and as it is an indispensable condition in all horse shoes to possess a certain width of web, otherwise

they will twist, or spread and break, the Charlier shoe, through lacking this condition alone, would prove a failure.

There are, however, other objections against its coming into use, and these are, first—the difficulty of ever getting farriers not only clever enough, but having patience enough, to put the shoe on, a more than ordinary obstacle, as the most casual observer will readily perceive. The second objection is, that from the manner the shoe must be fitted, just flush with the bottom of the foot, that the sole will have to bear more of the horse's weight than it is able to take. Third, the danger of the groove for the shoe being cut so deep as to injure the sensitive parts of the foot. Lastly, the difficulty, in the event of a horse losing a shoe at a distance from home, of having it replaced. These are all serious objections, but I consider the most serious one of all is the liability of the shoe to twist, break, and carry away with the broken parts the portions of the crust to which they had been attached.

Determined, however, not to be convinced by anything less than satisfactory proof, I made inquiries if any of our cavalry regiments had ever used the Charlier shoe, and learned that my old corps, the 10th Royal Hussars, had tried it four years ago at Aldershot, where they had been stationed for nearly twelve months, I therefore made a point of seeing Colonel Baker, whom I met at the Army and Navy Club, St. James' Square, when I asked him how the Charlier shoe had answered? In reply, he said, "Not at all. I had six horses per troop shod with

the Charlier shoe when the regiment was at Aldershot, and the experiment proved a failure. They broke so frequently that the horses' hoofs were nearly ruined in consequence. I had to give it up after it had a fair trial for six months," adding, "I like the system much, or rather the principle, but the shoe is a failure."

Since then I learned that the Charlier shoe had been tried in India with the 5th Lancers, my informant being an old farrier-major of that corps, named Richard Kemp, who was discharged from the army in 1870. By his account the Charlier shoe was so liable to twist or break that the nail-holes were made in the sides of the shoe, the nails being driven crossways through the sole, and clenched in the middle of the foot. It was an extreme measure to keep the shoe on the foot, and, like all extreme measures, it proved a failure, the accidents being as numerous as before.

The "Charlier," in my opinion, has failed in consequence of its inventor attempting too much. With perhaps one horse in a score the Charlier will be a great success, but not from any virtue or specialty in the shoe, but simply from these horses having peculiarly well-constructed feet. A horse with an exceptionally thick crust to his hoofs, good frogs, and soles to match in substance, will wear a set of Charlier shoes for three months, but the other nineteen would probably not wear them as many days.

So much for the Charlier, and now I will refer to the Goodenough horse shoe. If this shoe had been worthless in itself, instead of being quite the reverse,

the patentees who introduced it to the English public—viz. Frederic Robinson, Esq., and Edward Cottam, Esq., deserve the gratitude of all who take an interest in the humane treatment of man's noblest servant, the horse. I know that, great as the existing ignorance of horse-owners still is as regards the shoeing of these animals, this ignorance was tenfold greater before that account of the Goodenough shoe appeared in the "Times" some four or five years since. The attention it called to its assistance, and the consternation it caused among *the trade* of farriers, would be difficult to describe. Unfortunately, here again, too much was hoped for, too much attempted. The shoeing-smiths, as it threatened their means of subsistence, were against the shoe to a man, while many of the veterinary surgeons were equally hostile from other motives. The latter gave the shoe a bad name, and the former took care to put them on the horses' feet in such a way that they either came off or broke. Had the patentees simply tried to preserve the fore feet of horses, and only turned out fore shoes, the hostility of the smiths would, in my opinion, have never assumed one-third the proportions it did; while the masters—that is, the veterinary surgeons—would have found employment for their men, when they were not shoeing, in making hind shoes. Still, as I have already remarked, immense good accrued from the introduction of the Goodenough horse shoe into this country.

The chief merits claimed for the Goodenough shoe were its calks, its double bevel, and its narrow web.

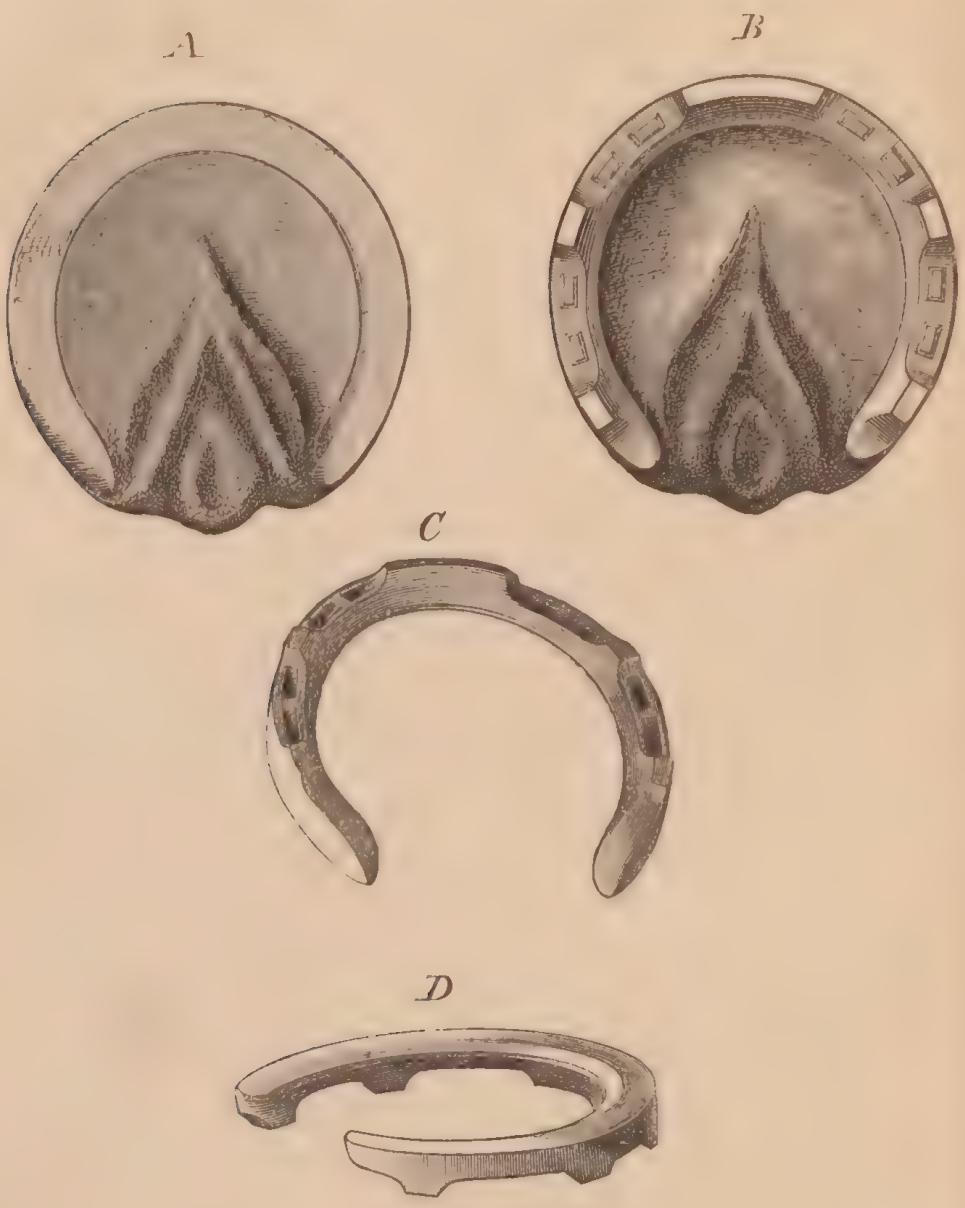

Fig. 10.

TO ILLUSTRATE THE GOODENOUGH SHOE AND SYSTEM.

A.—Foot prepared for shoeing.
B.—Foot with shoe on.
C.—Goodenough Shoe—ground surface.
D.—Goodenough Shoe—foot surface.

The calks or projections, as will be seen from the accompanying plate, were five in number, two nail-holes being between each calk. As these projections did not usually last over a week, while they took up space which would have been better employed for fresh nail-holes, when the crust had broken away, from any cause, elsewhere, I think the calks were no advantage to the shoe. The narrow web and its other advantages I need not again refer to; but the double bevel having not been touched upon to a like extent, I will give a short account of its merits. The bevel towards the foot-surface prevents, in the opinion of many professionals, any unnecessary pressure upon the sole, and old farriers even now carry out this principle to an outrageous extent, when they, by what is technically termed, "dish out the shoe." In my opinion, the bevel inside is not of so much consequence as the bevel on the ground-surface is. The latter prevents the picking up of stones, as the sloping insides of the shoe on the ground-surface afford no hold for foreign substances to lodge in. The same peculiarity keeps, to a great extent, snow or mud from *balling* between the sole and the iron, besides taking a better grip of the convex tops of the stones with which the middle of our streets are usually paved. The frog, by the Goodenough principle of shoeing, is not allowed to be pared away. As many of the streets are now laid with asphalte, and others with wood-paving, the advantage of frog pressure, in enabling horses to travel safely over such comparatively smooth surfaces, will be at once apparent.

That a strong objection exists among farriers to put on machine-made shoes I will not attempt to deny; but at the same time I feel confident these shoes must ere long come into general use. I would suggest, however, that ironmongers should become shoeing-smiths. By some means the men, when not employed putting on shoes, could be working at other branches of the smith's business instead of making shoes. I have drawn attention elsewhere to the ridiculous custom which assigns to the horse-shoe maker a pre-eminence much above his mate, who has to do the more particular part, namely, fastening the shoe on to the foot. With machine-made shoes this pre-eminence would disappear, as the "nailing on" will then, and justly too, become the important part. Another advantage horses would derive from being shod with machine-made shoes is, that such shoes cannot be tampered with in the same manner as hand-made shoes are constantly done. An ordinary shoe, when it has been worn nearly out at the toe, is not always cast on one side,—far from it; a fresh piece of iron or steel is welded on the toe, the shoe gets a fresh hammering, and on it goes again as a new shoe. A farrier told me that this lack of adaptability would always be against his adopting machine-made shoes.

But the benefit of machine-made shoes does not end here; they would ensure uniformity of weight, of construction, and last, though not least, of price. At present each farrier follows a particular fancy of his own, both in making of shoes and putting them on, which, in most instances, is injurious to the animals he shoes. And

this may be plainly traced to the fact that, there having been no system of shoeing in this country which has shown its pre-eminence over others, every smith has been at liberty to follow his own ideas, which, generally being prompted by self-interest, so the plan which allowed him most profit was usually adopted. Accordingly, with cheap iron, cheaper workmen were introduced—men perfectly incompetent often, for the duties they had to perform. Then followed that the making of, or putting on, a certain number of shoes was to constitute a day's work, all above which was to be paid for as over-time. Consequently shoe making and shoe fixing are now merely questions of turning iron bars into a certain circular shape, without reference to the form of feet they are to go on, in the first case; and in the second, it resolves itself simply into being able to nail on a shoe without pricking the horse.

On the other hand, had there been all along a correct shoe and a specific plan for shoeing before the public, the self-interest of farriers would have driven them to become acquainted thoroughly with the plan, as every owner of horses would, among other things, be able to see that an old shoe had not been put on again for a new one; a proper fair price for shoeing would likewise speedily become general, and the incompetent and knavish workmen would soon be forced out of the positions they now occupy. At present, if the nails but clear the quick, and the horse moves sound out of the forge, that piece of iron which can be shaped and put on the soonest is adopted, without the slightest consideration of what

the ultimate consequences may be to the animal—a very sad state of things, to say the least, which we have to contend against.

There are not many horse-shoe factories in the United Kingdom; but the shoes turned out from all I have seen are very creditable. Messrs. Shanks of Glasgow make a shoe, the merit claimed for which is its durability. This is attained by great pressure, the fibres in the iron being driven so close together by the force of a Naysmith steam-hammer, that the metal, when thus compressed, is said to wear double the usual time. If this is the case, of course lighter shoes could be made; but those I saw at Glasgow last year were wide clumsy affairs, that did not contrast favourably with the hand-made ones I was shown at the same time.

There are two or three factories where horse shoes are made near Wolverhampton; but I believe that the Horse Shoe and Foundry Company, at Wellington Road, Battersea, London, turn out shoes superior to any others in the trade. Only one description of horse shoe is, however, made here; but, as it is of an extraordinary good description, I will give a short account of it. It is a fullered shoe, having not only a bevel on the foot surface, but on the ground surface as well. Machinery does everything,—rolls the bars of iron, cuts these bars into lengths, puts the fuller in, turns the shoes to proper shape, punches the nail-holes, and turns them out ready for use. I do not know the prices of them now, but previous to the increase in the price of iron the cost of these shoes ranged from 1d. to 4d. apiece, at which they

were in great demand, not only at home but in India, Australia, the Cape of Good Hope, and on the Continent of Europe.

Supposing, however, the average price now of a set of four shoes to be 1s. 4d., and allowing 3d. for nails, and 1s. 3d. for putting a set of shoes on, the cost to the farrier will be 2s. 10d.; and, if we allow him 20 per cent profit, the cost of a set of machine-made shoes should only be about 3s. 6d. to the customer. I have not here taken into consideration the value of the old horse-shoes, but which can be safely put down at 2d. the set, to sell for old iron, when their profits would, of course, be so much more.

From a military point of view, machine-made shoes would prove a great benefit to the service. The difficulty of getting good farriers in the army has been always, to say the least, a very serious one; for year after year the difficulty has been increasing, and to this cause alone I attribute the short period our cavalry and artillery horses apparently serve. And if we reflect that troop horses are purchased when they are only 4 years old, or even younger; that their forage is excellent in quality, and sufficient in quantity; that their work is light, being but common exercise for them; and that they are selected by thorough good judges, assisted by practical men, such as the "Army Veterinary Surgeons," it certainly ought to surprise us to be told that cavalry horses only last, on an average, between 7 and 8 years. Out of the army a horse works for 12 or 16 years, and, properly, should be in working condition for double that period; for, by

natural laws, as a horse does not cease growing until he is 7 or 8 years old, his life should extend till he is aged 35 or 40 years. A horse the Shah of Persia brought over with him to England was declared to be over 50 years old; and in India I was shown, in 1853, a grey Arab, in a fort near Poonah, that had been ridden by one of our officers at the battle of Kirkee, nearly half a century before. With such facts before me, is it a wonder I should blame the bad shoeing-smiths of the army for much, if not most, of the mischief; to the once tailors, haberdashers, colliers, and clodhoppers, but now farriers, who first lame the horses until they are unable to walk, and then are cast and sold for a few pounds. In my own regiment, the 10th Hussars, just before it went out to India, out of 15 farrier-sergeants and shoeing-smiths, there were only the farrier-major and two others that had been farriers before they joined the army. One of the remaining 12 had been bred a tailor, and, as a tailor, had worked for the regiment. A second had been a collier, a third a groom, and so on through the dozen. No less an authority than Lord Napier of Magdala, in a circular dated from Simla, late in the year 1870, directed attention to the incapacity of a large number of army farriers and shoeing-smiths. And Lord Napier's is no solitary opinion, as the following extract from a letter written by the principal Veterinary Surgeon in India will testify, the reason the letter was written being as follows—Colonel Ryves, of the Bengal Cavalry, having written a useful little work upon horse-shoeing, some one suggested that a copy of the book should be supplied to

every shoeing-smith in a mounted corps. To this the principal veterinary surgeon replied in these words: "My experience of the farriers of the army is, that they are, generally speaking, men entirely without education, save of a mechanical description, and that, consequently, they are incapable of understanding or appreciating even the most rudimentary instruction in veterinary matters. The simplest language in which such information could be conveyed to them would be a mystery to the majority; and I believe I am within the mark when I assert that not one-half of the shoeing-smiths in the Bengal Army can read their own language or write it legibly. Without good primary education, it is an impossibility to convey technical language to any man, therefore I cannot concur in the suggestion," etc.

Another veterinary surgeon, under the assumed name of "Hippogriff, R. H. A." described so well, in a paper he contributed to the *Veterinarian* of November 1870, the characteristics of different farriers he had come in contact with, that I beg to quote some of his opinions: "In all farriers," this writer tells "there is an absence of method in conducting their duties when they extend beyond the forge; in some there is a want of confidence in themselves, although (as he rather sarcastically adds) never of presumption and self-conceit. Few possess education enough to comprehend the simplest forms and phases of disease, nor can the contrary, he thinks, be expected, so long as no proper institution exists for their instruction." In the sketches Hippogriff gives of the farriers of whom he has had personal experience, he

describes most of them as being "unfit even for shoeing-smiths. Prescriptions, written in plain English, they do not understand; the weights and measures in use are unknown to them; the common names of the most ordinarily used medicines are not remembered by them; compounding is to them an impossible perplexity; the administration of medicine is a difficulty; their notions of disease and lameness are curiously vague; whilst their method of procedure in the sick-box shows that they look upon the equine patients as neither *deserving* nor *requiring* careful nursing."

Now with such facts before us it appears a difficult matter to understand why this state of things should be allowed to exist; why the authorities have not taken steps long ago, either to get a better class of workmen in the service, or educated the men they have up to the required standard of technical knowledge. As the recognised difficulty is being unable to get men who can turn out a properly made horse shoe, the purchase of machine-made horse shoes would solve half the hindrance to the attainment of greater perfection among our army farriers. Again, as the introduction of such shoes would release one-half of these men to their duty, and as the worst workmen would go, it would be comparatively easy, then, for veterinary surgeons to carry on their duties. The saving to the country would be likewise great, for as there are about 500 farriers in the army at home, any cause which would release half of them to their duties in the ranks would prove an immense gain to the State; for less farriers means either so many more

efficient men in the ranks, or so many less to be provided for. If the former, the nation benefits by having 250 more cavalry men at home (and about the same number abroad) to do duty, while the expenditure would be decreased by £4000 per annum; and if the latter, as all the attendant expenses for themselves and their horses would be saved, the gain would not be less than £40,000 yearly. In this I have not taken into account the advantage the horses would derive from being shod with well-made shoes and by a better class of workmen, but there can be no doubt, however, of the result being alike beneficial to the health of the animals and to their longevity.

Again, how the hands of commanding officers, and of veterinary surgeons would be strengthened, as they would not have to contend against half the evils which bad-made shoes now inflict upon the horses, while there would be an exact regulated pattern of shoe for the whole army. The present regulation horse shoe in the service is of faulty construction, as it has a calkin on the outside heels of hind shoes, while the inside heels are drawn out to a point similar in shape to the tail of a fish, a fashion which makes a kick from horses so shod doubly dangerous. I have elsewhere drawn attention to the injury that all calkins effect, so I need say no more here upon that subject, except to point out that if hind and fore shoes were made alike, that is, the latter without heel-caulks, it would be quite an easy matter to make a fore shoe, by a few strokes of the hammer, serve for a hind shoe, and *vice versa;* when, instead of having to carry a spare set

of shoes, as at present our dragoons are obliged to do, they would only require to have one pair attached to their saddles, a matter of more than ordinary consequence on a campaign, when every ounce of extra weight tells upon their horses. That there are many deserving and good soldiers among our army farriers I should be the last to deny, but of really skilled shoeing-smiths in the ranks, the number is decidedly a limited one ; and while I allow that a man may be taught in the army the formation of a horse's foot and how to fasten a shoe to it in a proper manner, yet I doubt if a man, after he is fully grown, ever learns to make a horse shoe properly. In the British service there are schools of musketry, of music, of fencing, and even of cookery, yet, strange to say, there are no schools of farriery. In France, in Germany, and even in Belgium, schools of farriery form a part, and an important one, of the schools for cavalry in these countries, and it is one of the most striking illustrations of the inconsistency of our military system, that while it provides the best horses for the cavalry and artillery that money can purchase, and spares no expense afterwards for feeding and stabling them, yet in the important matter of shoeing, the poor animals are subjected to tortures from being operated upon by unskilful workmen, that renders them unfit for service although still young.

In the next chapter I give a short description of the "Chausée Horse Shoe," an idea of my own, which, I believe, will be found worth the reader's attention.

CHAPTER X.

THE CHAUSÉE HORSE SHOE.

THE prevention of slipping has determined, more or less, the shape of nearly all horse shoes of modern times, and therefore I am not diverging from the beaten track, when I submit this new form of shoe to the consideration of the general public. My idea is to combine an elastic substance like gutta-percha with the iron shoe, which in this way will, by its configuration and construction, be specially adapted to prevent either slipping or concussion—matters of more than ordinary importance in such an invention ; which, however, although often striven for previously by others, have never yet been to my knowledge, so fully obtained. The "Chausée Horse Shoe," like the "Goodenough" will be narrow webbed and double bevelled, though, at the same time, I may mention I do not attach so much importance to the bevel on the foot surface, considering that in a narrow webbed shoe it is not a point of such essential importance as the bevel on the ground surface is. The chief peculiarity of the shoe will be a groove, wider at the bottom than the top, into which a wedge of gutta-percha can be inserted after the shoe has been fastened to the foot in the ordinary manner.

The union of an elastic substance with the metal, after the shoe has been attached to the horse's foot, has, so far as I can learn, never been attempted before, but the advantages of such a combination are, in my opinion, so evident, that they scarcely need mentioning. It is well known that the mere act of a horse putting his metal shod feet to the ground does not wear out the iron to any great extent; what does cause the extraordinary rapid wear is the slipping of the shoes upon the stones with which the streets are paved. But for this slipping even a light set of shoes would last for three months, consequently, when the extra friction is removed, the necessity for any description of heavy shoes would disappear as well.

In the horse shoe I recommend there will be two substances, that differ not only in their densities and weights, but also in other and more important particulars. While the one is heavy and the other light; the former hard and capable of taking a high polish, the latter comparatively soft and lustreless; the iron slippery, the gutta-percha the reverse; yet it is only in such opposite qualities wherein we may hope to find a prevention to slipping and concussion, the prolific causes of so many injuries and diseases, of strains to the muscles, tendons, and ligaments of the joints, as well as of ringbones, splints, and spavins—all attributable to the two causes named above.

The gutta-percha wedge in the "Chausée" shoe would effectually prevent slipping, as it would always be flush with the iron rim on each side of it; so the one

substance would assist the other ; the iron preventing the too rapid wear of the softer gutta-percha, and that would in turn, by its adhesion to the ground, assist the

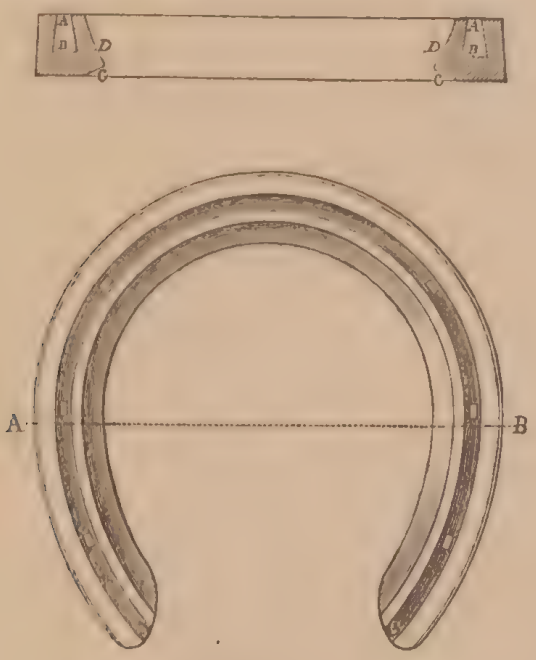

Fig. 11.

THE CHAUSÉE HORSE SHOE.

A B.—Line of section.
A.—Upper part of groove.
B.—Lower part of groove.
C.—Bevel on foot surface.
D.—Bevel on ground surface.

other to wear longer, besides enabling the horse to lift his feet up and put them down again without sliding about, as he is only too often obliged now to do with the ordinary shoe.

The evil effects of concussion,—of the firm hard blows from the ground, striking through the iron up a horse's leg that is being driven fast along the road, cannot be

over-estimated. Such common results as splints, spavins, and ringbones, I have already referred to elsewhere, as well as to another and more fatal disease known as foundered feet, due to the same cause—concussion. I have read somewhere that the meaning of the word foundered is *hoof-molten*, the name probably having arisen, from an idea held by old farriers, that the disease was owing to the melting of the fat in the horse's body, and thus falling downwards into the feet. I may also mention that there are two diseases of foundering to which horses are liable, the one affecting the chest and shoulders, the other the fore feet ; the last of which, however, I will only refer to here.

It is allowed that the cause of this disease proceeds from too violent exercise over hard roads, and that young horses are most liable to it ; of course all combined with heavy wide webbed shoes, fastened on to mutilated feet. We have only to imagine a horse so shod being driven at a fast pace along a turnpike road, to recognise the ruinous results which must follow. Iron, is, we all know, a rapid conductor of heat ; and if we wished to make it hot, except we put it into a fire, no better plan could be adopted than constantly hammering it,—the very plan carried out when a horse is driven rapidly over the hard stones of our streets and roads. The fast pace alone would cause a more than ordinary determination of blood to the feet, and when this is supplemented by hot heavy shoes, and soles pared so thin that the heat must pass readily upwards, can we, or ought we, to expect any other conclusion than that the internal parts of the

horse's feet should suffer from inflammation, or, as it is termed, "foundered?"

Narrow webbed, light, and elastic, the Chausée horse shoe would, if put on as I have recommended, effectually obviate all the ill effects of concussion, besides securing a foothold for the animal that no other shoe could give. Meant to be machine made, it would be attached to the foot by nails in the usual way. The groove, widest below, would still be large enough to admit the heads of the nails within it, and after the nails had been all driven, drawn up, and clenched, a strip of softened gutta-percha would be taken and laid in the groove in precisely the same manner that a glazier applies putty to a window frame when he is fixing in a pane of glass. Some cold water then, thrown over the foot, will sufficiently harden the gutta-percha, previous to which, however, the farrier will have cut away with his knife any portions that protruded beyond the edges of the iron groove.

The gutta-percha would effectually prevent the shoe from slipping, and when supplemented by frog pressure, a horse so shod could be galloped over an ice-field with safety. The elastic substance, preventing concussion, would prove likewise an immense benefit to all horses that from hard work, etc., had got shaky, or, as we term it, "groggy," on their fore legs.

The foot of the horse being formed on the principle of combining great firmness with great elasticity, and as the common iron shoe partly nullifies the latter, it will be easily seen how much this will be obviated by the

use of the Chausée shoe. We put on iron to adapt the foot for a harder surface than the horse finds in his natural pastures, and so far we may have acted wisely; but it is evident we should interfere as little with his natural action as the necessity of the case requires. As it is, the iron must, to a considerable degree, bind the foot and deprive it of not only expansion but much elasticity, and therefore the gutta-percha comes here to the assistance of nature, helping to recover the lost elasticity which the iron shoe had subverted.

When it is considered how great the weight is that the feet of a powerful horse has to sustain, and how violent must be the concussion at every step the horse takes upon the ground when rapid velocity is added to this weight, common sense must tell us that elasticity, in every part procurable, is the only quality which can combine ease, protection, and security, with great power of speed; and as this will be all afforded by the new shoe I here recommend, its many advantages will be apparent to all.

CHAPTER XI.

BENEFICIAL EFFECT OF KIND TREATMENT UPON HORSES.

BEFORE closing this essay I would fain say a few words more, not so much with regard to horse shoeing, but more respecting the horse himself and his treatment. In an experience of this noble and affectionate companion of man, now extending considerably over a quarter of a century in three parts of the known globe, I have found him at all times and in all places especially sensitive to kindness, having never had occasion to use any other treatment even with the most vicious animals, and I pity that man who can regard his horse with any other feeling than one of affection; for the person that treats him as a friend finds a delight in his work, that others destitute of the like consciousness can have no idea of. As the companion of man and his faithful friend, the horse ranks with the dog or the elephant. He certainly may not evince the attachment to his master that the former does, nor perhaps can instances be given wherein he has ever exhibited the sagacity of the latter, but the fault is not his. Were he as assiduously waited upon by his groom as the mahout attends to his charge—never absent from it day nor night, the horse would in all likelihood become as docile and

intelligent as the elephant, and if his master petted and caressed him as much as he did his dog, and was as long and as often in his company, doubtless the attachment between them would become as great. As it is, when a horse expresses his pleasure at the fineness of the weather or the elasticity of the turf on which he treads by a kick or a gambol, the feeling is promptly repressed by the application of whip and spur; for what is play in a dog, in a horse is regarded as vice. And if we but reflect how harshly often this best of animals is treated by mankind, how severely he is worked, and frequently how badly fed, it is a wonder as a rule the horse has not sunk as low as the ass. To the latter we attach an idea of slowness, stupidity, and degradation; but if we go to the East we shall find there that the ass is regarded as the type of bodily strength and vigour. In the Scriptures Jacob compares Issacher "to a strong ass,"* while in the Proverbs we are told, "a whip for the horse, and a bridle for the ass."† According to our ideas this last should read, "a bridle for the horse, and a whip for the ass;" but in the Eastern countries, where he is treated well, the ass goes as free, if not more freely, than the horse. The cause of this difference is not difficult to discover; ill-usage and neglect would in time have the same effect upon the horse as it has had upon the ass; it would make him slow, stupid, and degenerate.

When a horse is tenderly and kindly looked after, it is difficult to form any conception of how interesting and intelligent he becomes, watching his groom's every

* Genesis xlix. 14. † Proverbs xxvi. 3.

movement in the stable, day after day, and week after week, until he knows as well as the man himself what is next to be done. How patiently such a horse will stand to be cleaned or saddled, and how eagerly will he turn round to have his head groomed, or to be bitted, and how grateful is he for but a crust of bread, a handful of oats, a mouthful of hay, or even a kind word, when spoken in a kindly tone by his master. When such a man enters the stable the horse receives him with a neigh of welcome, pawing the ground with his forefoot until the master is alongside of and pats him on the neck encouragingly. As good masters make good servants, so do good kind grooms make good and affectionate horses. I do not mean the man who makes the horse's coat shine like satin, for drugs will give him a glossy coat while they undermine his constitution. I refer to the groom who, in addition to the lustrous look of the animals in his care, is never heard yelling at them to "stand over," or "come round," who is assiduous in his attentions upon them; who, recognising in them the possession of virtues and passions, and but scarcely less reasoning powers than he possesses himself, will never even commit an outrage upon their feelings, far less deny them merciful treatment.

Farriers, from the trouble they occasionally have with a young horse the first time it is shod, come to look upon all horses as being stupid to an extent which they think puts the animals completely beyond the pale of either kind or considerate treatment, and such is the deadly stupifying influence of custom, that these men,

perhaps not naturally inclined to acts of barbarity, yet live insensibly in the constant commission of the most cruel actions, without being apparently aware of their conduct. So it is not uncommon to find them wilfully torturing poor horses, who, having suffered ill-treatment often in a forge, shrink fearfully away from any one that wears a leather apron. Like the Neapolitan peasant, who lived in a village noted for robberies and murders, when he went once to confession, and having told the priest that on a certain fast-day he had swallowed a draught of milk, assuring the father he could recollect the commission of no other sin. "What!" said the confessor, "have you never assisted in the robbery and murder of travellers in the hollow road?" "Oh! yes, certainly," was the peasant's unabashed reply, "but then that is so common with us that we don't make it a point of conscience." As I was remarking, the farriers may be compared to this peasant, for with them cruelty comes to be regarded more as a thing for the display of mirth than of sorrow. One of these, more brutal, doubtless, than his fellows, when reproved for twitching a horse till the blood sprang from its nostrils, replied with a couple of oaths, that "you are making as much bother as if the horse was a Christian."

The most fruitful source of misery to cart-horses, is their being committed into the hands entirely of their drivers, the majority of whom are the most brutal and ignorant of that class of society to which they belong. You will see these men—for the brutal mind is always prone to tyranny—glutting their vindictive disposition

upon the poor animals under their charge, whenever they themselves are found fault with, or even should they be out of temper with something else.

These fellows further indulge their petty vanity and conceit upon their poor horses, and if one of them, forsooth, be offended at the figure or condition of the horse he drives, he will first endeavour by lies to set his master against the animal, by declaring, falsely of course, day after day, that the horse falls down, or that he won't back, or any other complaint equally plausible. I know a man, now, who having a horse given to him which *he* did not approve of, not only over-drove it, but gave the poor animal so little to eat that he actually fell down in the street from excessive labour and want of sustenance. Feeling confident that the rascal was starving his horse, I went early one morning, after the horse had just been fed, and found that the manger was filled with chopped straw. When I spoke to the fellow about it, he coolly assured me that the horse preferred it this way, adding, "whenever I give him any oats with the chopped straw, he leaves nearly all the oats at the bottom of the manger." What can be done with such men? Is horsewhipping not too good for them?

There is another cruelty horses are subjected to, especially in London, where there are so many bridges that toll has to be paid at. To make sixpence or a shilling, to be spent probably in drink, carmen will drive their horses miles round, and as they may have to be at their destination by a certain time, the horses with their heavy loads are driven at a pace far beyond their

strength, in order to make up the time lost in going the greater distance.

With coachmen, again, how frequently do we see one of them whipping one of his horses the whole length of a street ;* and for what? simply because the horse may have trod in a hole and stumbled, or slipped with his wide webbed shoes on the greasy pavement, in either case a misfortune for pity, not a fault for punishment.

How pleasant it is to turn from these disagreeable details of the treatment of horses in our own land, to the manner of usage which Asiatics in general, but particularly the Arabs, bestow upon their horses, never using whip or spur, but by caresses and talking, treat them as if they were animals largely endowed with reasoning qualities ; and well is this repaid by the superior docility and affection shown by these steeds for their riders. The question is, could not as much care be bestowed on our young horses if the gain is so great? I think so, and will endeavour to tell how.

There is probably no animal gifted with greater simplicity, and yet naturally so timid as a young horse. Whether it is the system of over-isolation, when keeping it in the meadow at first apart from mankind, that is the principal cause of this, is a subject that need not be entered upon here ; so, contenting myself that the fact exists, I will endeavour to point out why the simplicity

* The case, the other day, of Lady Abinger's coachman is one in point,—he brutally flogged his horses because her ladyship had spoken to him sharply ; thus venting his spleen upon the backs of the animals he was driving.

should be cultivated and the timidity subdued. A colt or filly that has never been away from the stable wherein it was foaled, or the grass field in which it was reared, is not likely to acquire either the vice of kicking, rearing, or bolting when there, and as its only probable intercourse with man has been when it was caught and haltered for some purpose or other, its timorousness instinctively increased. We find it, therefore, when purchased by the dealer, to be very foolish in its ways, and very fearful of strange things; but as it is also gifted with great trustfulness, it is no sooner made to believe that the person or the thing seen will not harm it, than the timidity lessens and soon entirely disappears.

Working upon this knowledge therefore, we have only to use caution and kindness to make the young horse fearless, gentle, and confident, and it is at the commencement of the tuition where the greatest care, tenderness, and thoughtfulness are required. The young horse does little at first, and it is during these few weeks' inaction in loose stalls that much can be done in getting it to understand what it is required to do in simple things, such as giving its feet up to be washed out, lowering its head to be groomed or the collar taken off, to stand over in the stall, or to come round in it when spoken to, and such like. It should always be spoken to in going to stables and when leaving them, and called by some particular name, the shorter the better, by the use of which it will quickly learn who is meant. A horse soon learns to know its master's voice; and, child-like, prefers a gentle firm tone to a rough bullying one.

The harsh command or oath of an ill-tempered man grates as much on the sensitive ear of a young horse as it would on the ear of an infant. The latter would show its displeasure by squalling out; the former, most likely, by lashing out with both heels at the person who had terrified it; but you cannot speak to it too much if you do so kindly; whether it be to give you up its feet, to come round, or to stand over, let the voice be used, accompanied by a wave of the hand indicating the direction meant. Whenever it does what is wanted, it should be "made much of," by patting it on the neck, for it likes being caressed, and will endeavour to deserve such treatment.

When the young horse has been taught thus much, it should next be taught to allow its collar to be taken off and put on quietly. All horses, and especially young ones, are particularly sensitive about the ears, and the slightest hurry or rough usage at first, done through a moment's forgetfulness, may take months to undo. When the collar is wanted to be taken off it should be opened to the fullest extent, and getting the horse's head as low as possible, the collar should be then passed over very gently, and if this can be done without touching the ears so much the better, and the same care is to be taken when putting it on. If this is managed skilfully for two or three weeks, the worst of that part of the business is over, for the animal, finding that it has nothing to fear, will confidently push out its nose either to have the collar taken off or put on.

At the first, second, and third shoeings, equal, if not

greater care must be taken, and I would advise every owner, when possible, to be present himself on these occasions, for I can assure him the trouble will be amply repaid.

I shall now conclude with the sincere wish that as education extends among the human family, the regard and esteem for the horse may also increase, so that, before long, it will be the duty, heartfelt in all men, to strive to lessen the toil and make life as pleasant as possible to man's best friend, the horse.

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